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Air Conditioning & Refrigeration News

The Newspaper of the Industry

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IN THIS ISSUE

Readers have often asked for a short-cut method of estimating the load for typical commercial refrigeration jobs. Well, a reader finally submitted one, in the form of an easy-to-use chart. Page 14.

* * *

Appliance sales didn't go "down" on the farm for a dealer in Greeley, Colo. How he made them go up with a specialized sales program is told on page 6. The story of another successful appliance merchandising operation in a small community is told in a story starting under a two-column headline at the bottom of this page.

* * *

Can air conditioning "pay out" to a dealer? When the air-conditioning department of Carter-Waters Corp. of Kansas City showed nothing but red ink for three years, Albert R. Waters decided to call a halt to no-profit air conditioning. His keen analysis of the faults in his operation should point the way to profit making for other dealers faced with the same problems. Page 10.

* * *

How an air-cooling system fanned losses into profits in a photography shop's rental darkroom for amateur camera fans is told in a story on page 8.

* * *

Seeking definite proof that air conditioning is really an aid in improving working conditions, one manufacturer ordered a survey agency to make a comprehensive study. Results of this survey, which will make good talking points for those selling air conditioning, are reported on page 8.

* * *

Next Week

Specifications of all leading makes and models of 1939 household electric refrigerators will be published in a special supplement to the next (March 29) issue of AIR CONDITIONING & REFRIGERATION NEWS. If you desire any extra copies of this issue, get your orders in early to avoid delay. Extra copies 20 cents each, 10 or more, 15 cents each, 50 or more, 10 cents each.

It is also planned to publish an extra helping of information on successful sales and sales promotion methods in this issue, to make it all the more valuable to dealers and their salesmen.

Crosley Car May Be Around the Corner

DETROIT—Persistent reports are now emanating from Detroit parts manufacturers that Crosley Corp. will soon be ready to market a new low-priced sports car, priced below the Willys. This car has been rumored for several months.

Detroit sources reveal that one body manufacturer has completed tooling for this job, and Ward's Automotive Reports state that Crosley has already produced some engines. These sources estimate that production could begin within a month if Crosley decides to go ahead at this time.

Vice President Lewis Crosley declares:

"We have absolutely no statement to make on this matter at this time."

Frozen Foods Displayed By Appliance Dealer

COLORADO SPRINGS, Colo.—Realizing that the increasing popularity of frozen foods has created high interest in low-temperature cabinets provided in the latest model refrigerators for keeping these foods, Halle's Majestic Electric Co., appliance dealer here, arranged a reciprocal display tieup with a local distributor for the frozen products which has increased the sale of both foods and refrigerators.

Approaching a local dairyman who

(Concluded on Page 5, Column 4)

Iowa Bill Licensing Locker Storages Is Sent To Governor

DES MOINES, Iowa—Final legislative approval was given last week to a bill that defines and licenses refrigerated locker plants and provides a lien upon food stored in lockers in favor of the plant operator. The measure has been sent to the governor for his signature, or veto.

The measure is believed to be the first proposal for licensing refrigerated locker plants to be enacted by a state legislature.

The state department of agriculture is charged, under terms of the act, with licensing locker plants, first determining on examination of the plant whether sanitary conditions and equipment which "in the judgment of the department" are necessary for the proper operation of the plant have been provided.

As originally written, the bill would have assessed annual license fees of $12 on all plants. It was amended, however, to assess an annual license fee of $10 for the first 200 locker units and $2 for each additional 100 lockers or fraction thereof in each plant.

In furtherance of sanitary provisions governing the measure, it provides that "all food must be sharp frozen before it shall be placed in a refrigerated locker, and shall be kept at a temperature of 15° F. or less during the period it is kept therein."

The department is to establish rules governing preparation of food

(Concluded on Page 5, Column 1)

Don Scott Heads Bendix Appliance Division

SOUTH BEND, Ind. — Don O. Scott has resigned his position as president of the Hydraulic Brake Co. to assume the full management of Bendix Home Appliances, Inc., it was announced. Both companies are subsidiaries of the Bendix Aviation Corp.

It was also announced that William H. Leininger, advertising and sales promotion manager for Bendix Home Appliances, Inc., has resigned in order to accept a similar position with the Kellogg Co., Battle Creek, Mich. Parker H. Erickson, who has been in charge of advertising for Bendix Home Appliances, succeeds Mr. Leininger as head of sales promotion.

Zenith '39 Refrigerator Line Offers '7-Zone' Food Storage

DULUTH, Minn. — "Seven-zone" food storage is the No. 1 talking point of the 1939 line of Zenith household refrigerators manufactured and distributed by Marshall-Wells Co., which maintains headquarters here and branches in Portland, Ore., Spokane, Wash., Seattle, Billings, Mont., and Minneapolis.

The line is comprised of one 4-cu. ft. model (Standard), four 6-cu. ft units (Special, Leader, Master, and Deluxe), and a Deluxe 7-cu. ft. model.

According to the company's promotional literature, top models in the new Zenith line offer extra-fast freezing on the freezer shelf, sub-zero storage within the freezer, extra-cold storage in the defrosting chest, perfect meat preservation temperatures in the sliding meat chest, moist cold storage for greens in the sliding vegetable crisper, normal food storage on the regular shelves, and non-refrigerated storage in the rolling storage bin.

All models in the line are equipped with the Zenith "Econopower" refrigerating unit (which boasts only

(Concluded on Page 24, Column 5)

Natkin Suggests Association Program For Air-Conditioning Dealers

By Henry Knowlton

KANSAS CITY, Mo. — Changing a "wildcat" business into a stabilized industry should be the first concern of a national air-conditioning association, asserts Benjamin Natkin, of Natkin & Co., who believes that many benefits will result from affiliation of local groups in a nationwide organization.

After doing one million dollars in air conditioning during 1937 on 115 jobs and something less than that during 1938 on 120 jobs, Mr. Natkin has come to the conclusion that the entire industry is in need of what he terms "stabilization."

Mr. Natkin advances the following program for a national association:

1. Education and publicity—Mr. Natkin feels that the air-conditioning industry needs more well directed publicity and better public education to counter-act the erroneous impression which many people have of the term "air conditioning," what it embraces, and what it costs.

2. Bidding practice—Some uniform method should be obtained of getting a parity on tonnage bid for any given job. This may be obtained by universal use of the "uniform bid sheets" now in use by local associations in certain cities.

3. Uniform National Code—Codes covering refrigeration, air conditioning (sheet metal and ductwork) and operation of refrigeration systems should be formulated on a national basis to guide interested cities in the adoption of local codes.

4. Design Standards—Mr. Natkin believes that the National Air Conditioning Association should cooperate with the A.S.H. & V.E. in working out design standards which will be acceptable to architects, en-

(Concluded on Page 8, Column 4)

Carrier Room Cooler Priced At $237.50

SYRACUSE, N. Y.—An important break in the price scale of room cooler equipment is evidenced from the announcement by Carrier Corp. of a new unit to sell for approximately $237.50 to $250.

Only 26 inches high, the new conditioner is said to have a capacity slightly under the ¾-hp. unit which sold for $400 last year. Carrier engineers claim the new unit will provide "true air conditioning" for a medium sized room or office.

The company also has announced a new standard size room cooler having the same capacity as in former years, but reduced in size to occupy 20% less floor space and 40% less space in all.

Refrigerating capacities established for the new units are 1,000 lbs. of melting ice per day for the "midget" conditioner and 1,500 lbs. for the standard room cooler.

Both conditioners feature a smoke exhaust which will operate independently of the cooling mechanism. This arrangement is said to eliminate all smoke from a medium sized room in three or four minutes.

Both conditioners were designed by Lurelle Guild, industrial designer.

N. Y. 'Roundup' Drive On Iceboxes Started

NEW YORK CITY—Revival of business enterprise through stimulation of the household refrigeration industry is the long-range purpose of Consolidated Edison Co.'s "Old Ice Box Round-up," a local refrigeration merchandising campaign launched this week, according to speakers at a banquet held March 14 in the grand ballroom of the Waldorf-Astoria to officially set the stage for the drive's opening blast.

Addressing an audience of more than 2,000 people, including executives of the 13 refrigerator manufacturers cooperating in the campaign, 12 distributors, 875 approved dealers, and representatives of banking, advertising, and utility interests, Floyd L. Carlisle, chairman of the board of Consolidated Edison Co., declared that the solution of practically all other major problems depended on and would naturally follow the revival of business. Mr. Carlisle's talk was picked up and cut into the utility's regular broadcast over radio station WJZ.

Details of the campaign were an-

(Concluded on Page 2, Column 1)

Crossroad Store Owner Finds Appliances Easy To Sell—Just Keep Talking It Up

By T. T. Quinn

Editor's Note: This is the first of a series of reports from the field by staff members of AIR CONDITIONING & REFRIGERATION NEWS on how sales of appliances are going *now* in both large and small communities, and which will describe some of the present-day selling methods which are proving successful.

LISBON, N. Y.—You don't have to live in the city to do a "big town" job of selling electrical appliances.

Working out of this upper New York hamlet of about 200 people, Stanley P. Dwyer last year sold 40 General Electric refrigerators, six ranges, 34 washers, 37 radios, and six commercial refrigeration jobs.

So far this year, his orders have called for 23 refrigerators, seven ranges, two water heaters, 10 washers, five radios, five milk coolers, and a beverage cooler.

There's nothing mysterious about this sales record, if you ask Mr. Dwyer. It's simply that he knows just about everybody in his territory personally, keeps in close touch with anybody who might tip him off to a sale, and never quits trying to get business.

Mr. Dwyer runs a general store . . . one of those where you can buy anything from a needle to a threshing machine . . . and his association with the appliance business dates back to the night, a few years ago, that Myles Watkins, field man for Langdon & Hughes Electric Co., Utica, stopped in to sell him a radio for his own use.

Mr. Watkins' first call was fruitless—but he did stay long enough to observe that here was a live-wire country merchant. So, on his next call, he said nothing about selling a radio—but instead purchased $16 worth of groceries. He walked out with a signed order in his pocket.

It wasn't long after that until Mr. Dwyer signed up to sell first one product, then another . . . and ended up by becoming a full-line dealer.

Lisbon is in the midst of a rich farming area, and in his capacity as a general merchant Mr. Dwyer serves the whole community for miles around. His grocery route, for instance, is a prolific source of appliance leads.

Driver on this route, David Middlemiss, has become quite adept at discovering a housewife's interest in purchasing a new refrigerator or other appliance. While he's making his deliveries, he casually introduces the appliance topic, if the farm wife herself doesn't bring it up.

All likely prospects are reported back to Mr. Dwyer, whose ability as a "good closer" helps transfer many

(Concluded on Page 4, Column 1)

Frigidaire Tops '38 Advertisers Of Refrigerators

Westinghouse Second In Magazine Expenditures Total Off 50% From '37

DETROIT—With many major appliance manufacturers more than halving their 1937 expenditures for advertising household refrigerators in national magazines, figures compiled in a recent survey show that in 1938, 10 leading producers of electric refrigerators spent only $1,569,407 to advertise these products in national periodicals.

In 1937, the 14 refrigerator manufacturers whose magazine advertising expenditures were in a similar survey spent a total of $3,015,836.

These figures include, in addition to expenditures for refrigerator advertising, costs of "combination" or "ensemble" advertising, in which refrigerators are featured along with other home appliances, and expenses of advertising consumer contests.

Frigidaire again topped the list of refrigerator advertisers by spending $344,305 in 24 publications. Magazines most favored by this company were Saturday Evening Post, which received $58,450; Collier's, which received $37,140; and Woman's Home Companion, which cornered $28,400 of the appropriation.

Westinghouse climbed to second rung on the ladder by spending a total of $293,100, $78,000 of this going to American Weekly, $69,000 to Saturday Evening Post, $43,500 to Collier's, and $41,500 to This Week.

General Electric Co., which receded the least from its 1937 budget, spent $287,370 in 20 publications. Saturday Evening Post got the lion's share ($60,950) of this appropriation, while Ladies' Home Journal came in for $34,500, to take second place.

(Concluded on Page 24, Column 3)

Utility Drops Sales To Test Dealers' Ability

MARINETTE, Wis.—Sales of all electrical and gas appliances in this city and in Menominee, Mich. by the M. & M. Light Co., utility, will be temporarily discontinued, effective March 27. Duration of the experiment will depend on the dealers' ability to sell the merchandise, H. H. Fisher, company manager, announced.

Mr. Fisher told 25 dealers in attendance at the meeting for appliance dealers called by the M. & M. Light Co. that the company had been selling gas and electrical appliances primarily to develop the use of gas and electric service, introducing new appliances so its customers could fully utilize the services offered by the utility.

Should the trial period indicate that retailers, including dealers, merchants, and plumbers, jointly sell as many appliances under the new plan as were sold under the old plan, including company sales which amounted to $38,000 in Marinette and Menominee in 1938, the company proposes to remain out of appliance retailing. However, if a substantial decrease in the total sales is noted, the company may re-enter the merchandising field, Mr. Fisher said.

Under the new plan, the utility's representatives will contact and assist local dealers and will use its office display floors in the two cities to display electric refrigerators and other electrical appliances, lamps, gas ranges, and gas hot water heaters.

The use of the sales floor will be allocated among the dealers so that each one will have an opportunity to use the floor and window display space. The company plans to remove its present stock of merchandise from the display floors in both cities.

Uniform Allowance on Ice Boxes & Reduced Finance Terms Are Wedges In N.Y. Sales Drive

(Concluded from Page 1, Column 4)

nounced by E. F. Jeffe, Consolidated Edison's vice president, who served as toastmaster. J. S. Knowlson, chairman of the board of Stewart-Warner Corp., spoke for the manufacturers, and M. H. Aylesworth, publisher of the New York World-Telegram, presented his reactions to the drive.

Mr. Jeffe declared that the objective of this campaign was the same as that of the recent "bargain package" drive which resulted in the sale of more than 900,000 appliances with a sales value in excess of $5,600,000, i.e. business recovery through increased employment, and social improvement by making approved appliances available to low-income-bracket customers at bargain prices and on easy payment terms. He predicted that "at least $10,000,000 worth of automatic refrigerators should be sold in this territory in the four months of April, May, June, and July."

The attractive prices set by manufacturers for their 1939 models, the $9.50 ice box allowance offered in the campaign, the reduced financing terms which make it possible to purchase a 3, 4, 5, or 6-cu. ft. box for the same monthly payments, and economical gas and electric rates—this combination should prove an irresistible lure for many of the million-odd families in the New York territory who do not now have mechanical refrigeration, Mr. Jeffe explained.

Most of the major manufacturers are cooperating in the drive, he said, and thousands of utility and dealer employes will comb this area for refrigerator sales during the duration of the campaign.

Praising the utilities for having "read a new significance into appliance selling," and for having developed "a new technique of 'push rather than pull,'" Mr. Knowlson declared that the 13 cooperating manufacturers he was said to represent believed the campaign to be "a new milestone in industry cooperation."

Mr. Aylesworth stated that those taking part in the campaign "seem to have a complete answer for those without modern refrigeration, even those in the lower brackets of household income."

He, too, emphasized the fact that the campaign would benefit refrigerator purchasers as well as members of the industry.

"The electric and gas industries," he declared, "have intelligently advertised their scientific progress, their services, and their merchandise. By staging this campaign," he told his listeners, "you will inspire other industries, put people to work in factories to increase production, put new salesmen to work to sell the products of this increased industrial activity, and render a great public service by selling a necessary health-giving convenience for the home."

Family Income Gain In January First In 14 Months

MINNEAPOLIS — The average American family had a larger cash income in January than it had in the same month a year ago to mark the first gain in 14 months, according to a monthly study of what people get and spend, issued by Investors Syndicate.

Increased wages and salaries were for the most part responsible for the rise, it was stated. "Real income" index at the start of February of this year was $1.04 as compared with $1 at the same time a year ago.

Living costs in January were three cents on the dollar lower than in January, 1938. Cash income index, on incomes from all sources, was $1.01 for January as against $1 in the same month last year.

Wages in January rose to $1.17, whereas in 1938's first month the index was $1. Salaries were up only three cents on the dollar. Income from business and agricultural enterprise remained at 98 cents, the January, 1938 level.

Investment income, in the form of dividends and interest, stood at 66 cents as compared with January, 1938's index of $1.

Food was down three cents on the dollar, clothing five cents, rent one cent, and miscellaneous living expenses four cents.

Statistics for the study were compiled for Investors Syndicate by Cambridge Associates, Inc. from studies by government bureaus and independent research organizations.

KEROTEST'S NEW CATALOG NO. 9

Now available upon request—the 1939 Edition of the most thoroughly used Handbook of Information in the refrigeration world . . . containing over 30 pages of new, useful data on the Kerotest line of Valves and Accessories for every refrigeration and air conditioning installation . . . replete with types, sizes and prices in logical, concise order to save you time and trouble. Your local Kerotest Jobber will be glad to supply you with your copy. Ask him about it.

KEROTEST MANUFACTURING COMPANY
PITTSBURGH, PA.

THE COLD CANVASS

By B. T. Umor

The Boss Can Use Some Air Conditioning

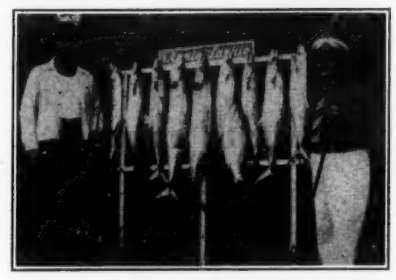
"There should be a footnote on a study of air conditioning and personnel indicating the reaction of the help when the big boss air conditions his own office and leaves them to swelter outside," says Advertising Age.

Smart members of the "help" will say that a man in the position of the "big boss," with all his responsibilities, is **only being fair with his stockholders** when he air conditions his office and thereby insures the full efficiency of his high-powered mental machine.

Only a dumb-cluck would crab that the boss had indulged himself with a luxury. That's no way to get a room cooler in the bull-pen.

* * *

Sport of Presidents



R. W. "Dick" Kritzer, president of Peerless of America, Inc. (left) and Commodore V. P. Warren, president of Larkin Coils, Inc., share the result of their day's fishing in the Gulfstream off Miami on Commodore Warren's yacht "Annie Laurie." It is reported that "Dick" now has sand in his shoes, and promises to do even better on his next day's activity on the "Annie Laurie."

* * *

Frigid Falstaff

Refrigeration's self-appointed ambassador, king of hokum dispensers, and ballyhoo artist par excellence, Jim "I-sold-a-refrigerator-to-an-Eskimo" Moran, has just finished another feat in his quest for the screwball championship.

According to a dispatch from Clarence H. Rosen of Pioneer Air Conditioning Corp., Minneapolis, Jim labored a week trying to find a needle in a haystack, and by golly, he located the illusive gadget and sent it to the Smithsonian Institute for coming generations to gape at.

The goofy stunt specialist reported that he found the needle near the bottom and slightly to the left of center in the stack by using the "straw-by-straw" method. He found that the "conical approach"—circling upward from the bottom of the stack—and the "depth bomb" style—starting at the top and circling downward—were ineffective.

At that, he wasn't performing for "coffee and doughnuts." During the last three days of his search, he made $20 a day by selling straws from the haystack to souvenir hunters—10 cents apiece to adults and five cents to children.

He then headed for Florida to lay a cornerstone in a skating rink with a block of that real glacier ice he carted from Alaska.

* * *

Spring Prospects

Speaking of Spring business prospects, a furniture paper recently ran this headline:

EXPECT DEMAND
FOR MATTRESSES
TO HOLD STEADY

* * *

Tax Me Around Again Willy!

Proposed new taxes are going to hit at "the man with a thirst." Down in Georgia, a legislator has a tax plan that he claims is perfect. There would be a 10% tax on the first drink of liquor, 20% on the second, 30% on the third, and 100% on all the rest.

"It's 'perfect,'" reasons the canny Georgian, "because after the taxpayer's third drink he wouldn't care what the tax was."

Well, some of those Federal tax schemes have made us pretty whoozy, but we're still able to stand up and kick.

And a bill out in California would require each drinker to take out a license. Just when the celebrant is about to tee off on a "Speeder's Special" the alcohol sleuth can blast his whistle and growl, "Pull over to the side of the bar, buddy, and lemme see your license."

* * *

'Who Done It?'

Someone, sometime, somehow in 1938 sold an electric household refrigerator for $193 to somebody in Iceland. It says so in the export figures compiled by the Bureau of Foreign and Domestic Commerce.

C'mon, now! 'Fess up! Who done it?

Old B. T. U. wants the lowdown on this deal.

* * *

Maybe It's Baby Snooks

All the scientific standouts up at General Electric were completely stumped for the answer to the question sent in by a little girl from New York City, who wrote: "Will you kindly send me a little sample of electricity, if you can spare it. We are studying about it in geography."

It was suggested that they get around the situation in answering by wire.

* * *

Gas-Driven Gas Shelter

The "better 'ole" for protection from gas in the next war may be right in your own car.

Tests by Nash-Kelvinator officials during the last war scare revealed that occupants of an air-conditioned Nash were quite safe from the deadly fumes.

Tests were made in a gas tunnel after gas filters had been installed in the conditioned air system of the car and windows and doors sealed with tape. With poisonous bombs bursting all around the touring shelter, it was reported that none of the occupants suffered ill effects.

Which all makes it nice when you can herd the folks into the family bus and actually "ride out" the gas storm, with a road map of your plan of battle.

* * *

Always Remove Your Hat

"I'll have to call my boss for instructions. I never got inside before"

From *Collier's*

* * *

Top Billing Please

Guess everyone likes to have his name mentioned—and likes nothing better than to have his moniker lead the list. First Dale Carnegie, and now Zenn Kaufman in his new book points this out very emphatically.

From movie star fighting for top billing down to the lowliest sort of individual this is true. Zenn tells this one:

A tramp was walking down a country road. Farmer Si Jones came along and gave him a lift. Soon they passed Farmer Brown, who solicitously inquired:

"Hey, Si, whut yu got?"

"Oh, jes' a load o' manure and a tramp."

No comment from the tramp. Soon they passed Farmer Johnson.

"Hi, Si, whut yu got?"

"Oh, jes' a load o' manure and a tramp."

Still no comment from the tramp. A bit later, Farmer Roberts came by. Same question. Same answer. Whereupon the tramp climbed up to the front of the wagon, tapped the farmer on the shoulder, and with righteous indignation said, "Please, mister, mention me first."

. . . A Duck Can't Fly on One Wing!

nor can a dealer operate satisfactorily on *one* special!

Go after ALL pocketbooks with the Crosley complete line of "SPECIAL" Shelvadors.

Why limit yourself with ONE 6 ft. Special or last year's models when countless prospects are thinking in terms of new refrigerators in 3, 4 and 5 ft. sizes for a little over a hundred dollars.

It Takes a Full Line to Get a Full Response!

REACH, INTEREST and EXCITE every refrigerator prospect with the fact that CROSLEY SHELVADORS are the M O S T they can buy for their money whatever their ideas or requirements.

"CROSLEY IS THE LINE OF SPECIAL SHELVADORS GETS THE PROSPECTS IN '39

6 cubic feet

$132.50*

The Crosley "SPECIAL" is a *line* of SPECIALS — not just one model —the lowest priced electric refrigerators in the industry! The step to longer profit in higher priced models is simple, easy and logical. The Crosley "REGULAR" and "DE LUXE" lines complete a perfect merchandising picture — definitely offering the correct step-up in pricing — in features — in appearance — in performance and quality and in larger capacities on any competitive price level. Get ALL prospects in your store with LOWEST PRICES. Sell them in your store with the industry's BEST VALUES.

LINE FOR '39"

3 cu. ft. $99.50*

4 cu. ft. $112.50*

5 cu. ft. $122.50*

*DELIVERED AND INSTALLED... 5-YEAR PROTECTION PLAN $5.00 ADDITIONAL... PRICES SLIGHTLY HIGHER IN SOUTH AND WEST

THE CROSLEY CORPORATION

POWEL CROSLEY, Jr., *Pres.* CINCINNATI

Major Appliances

Two Firms Announce Toaster 'Trade-Ins'

NEW YORK CITY — A trade-in deal on a toaster is being offered by the General Electric appliance and merchandise department for a spring merchandising feature.

The appliance involved is the new General Electric streamlined automatic toaster, which has a regular list price of $16. A $2 allowance will be made on the customer's old toaster in an effort to introduce the additional conveniences of the automatic device, added to the G-E heating device line last December, making the new selling price $14.

The offer, just announced to the trade, will be good until June 1, and is slanted particularly at the June Bride and Mother's Day Market.

McGRAW TO ALLOW $2

ELGIN, Ill.—The "trade-in" idea (or problem) has reached the toaster field, with the announcement last week by the Toastmaster Products division of McGraw Electric Co. of a special "trade-in" campaign to run March 20-May 31.

The allowance to be given on the old model toaster is $2, but it will be given only when the new purchase is the two-slice automatic model, the deluxe or the standard hospitality set, or the Toast'n'Jam set.

Alabama Dealer Wins In 'Ringer' Case

BIRMINGHAM, Ala.—A jury in circuit court here unanimously dismissed a $3,000 damage suit brought against Carlisle Electric Co., appliance dealer, by a customer whose hand was caught in the wringer of a washer she bought from the concern.

The jury took this action even though one of the jurors tinkering with an identical washer entered as "Exhibit A" in the case got his finger mashed in the wringer and his gold ring damaged.

Wood Promoted In G-E Advertising Dept.

BRIDGEPORT, Conn.—Donald A. Wood has been named manager of the advertising service division of the General Electric appliance and service department here, succeeding R. W. Hart, who has resigned.

Mr. Wood joined the G-E accounting department at Schenectady in 1926, and the following year became associated with the publicity department as part of the mechanical production section. In 1931 he became Bridgeport representative of the Maqua Co., printers and engravers, until his recent appointment.

Hotpoint Introduces New Range For Showing

CHICAGO—A new Hotpoint range, with two utility size and one giant size Calrod surface units—all three with a selection of five different heats, has been announced by Edison General Electric Appliance Co., Inc. for the Modern Kitchen Bureau's spring range showing.

New model, known as the "Manchester," has a cooking range on the surface units from the high speed for quickly starting cooking operations to the simmer speed for cooking foods requiring extremely low heat and for keeping foods warm.

Oversized, two-unit, directional heat oven, with duo-speed broiler, also has a selection of five heats for baking, roasting, broiling, or oven meal cooking operation. Without increasing the connected load, it is said that the duo-speed broiler turned to "speed broil" provides heat for fast "charcoal type" broiling. Set at "broil," the heat is regulated for lower temperature broiling, toasting, and barbecue type foods.

Door is streamlined and the drawer handles are of molded black Textolite, as are the snap-on-type switch buttons. Range is finished in triple-coat white porcelain enamel, with the one-piece "monotop" cooking top finished in porcelain.

Other features in the new range include the six-quart "thrift" cooker; automatic oven temperature control; oven pilot light; appliance receptacle located on the switch panel; porcelain enamel drip tray under the cooking surface; and three large storage drawers.

SIX YEARS IS A LONG START IN ANY RACE

...AND DULUX IS THAT FAR AHEAD

REG. U. S. PAT. OFF.

IT'S SIX YEARS since the first refrigerator finished with DULUX rolled off the production line. Six years of experience and service in working with refrigerator manufacturers. Six years of refinements and improvements that have made DULUX even better. Six years' head start in the field of synthetic finishes. And six years is a mighty long start in any race!

Today, DULUX is used by 85% of all refrigerator manufacturers. It sparkles on millions of modern refrigerators. It is the overwhelming favorite because it is a finish of enduring beauty, gives greater-value, lower-cost refrigeration to more families.

WHY? For three powerful reasons: DULUX *keeps* its whiteness. It is easy to clean. It is resistant to chipping and cracking.

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Finishes Division...Wilmington, Delaware

DU PONT DULUX *The Modern Refrigerator Finish*

REG. U. S. PAT. OFF.

Watches Sales Rise

George Chapman, manager of General Electric's specialty appliance department, says that continuation of the present increased volume will help dealers make more money in 1939. G-E sales are booming.

'Big Town' Business Is Done By Dealer In Small Community

(Concluded from Page 1, Column 4)

such leads into the sales columns. Much of his time is spent in actual sales work, and while he's out of the store his clerk keeps a careful tab of prospects uncovered there.

Although he can—and occasionally has—sold "from the catalog," Mr. Dwyer appreciates the value of a full display, and his showroom stock would do justice to many a store in a much larger community. And despite his large personal acquaintanceship, he is continually recalling himself and his business to the territory through consistent weekly newspaper advertising.

He dislikes selling on Sunday . . . but one of his favorite stories recounts the time he opened his store on that day when a farm couple made a special trip to town, sold a brand-new model "from the catalog," uncrated the only model he had in his warehouse to let them see what they'd bought, and made delivery the first thing Monday morning.

Like many another small-town dealer, Mr. Dwyer is not adverse to getting into the egg, poultry, or livestock business when it means a sale. He'll swap for anything . . . horses, cows, poultry, eggs, dairy products, vegetables . . . as part payment on a refrigerator, range, or other appliance. And all at the market price, with no commission for his own time and trouble. It's all in the sale, to him.

A good share of his appliance business comes to Mr. Dwyer through friendships he has cultivated with the men with whom he does business . . . butter and dairy products men, produce men, and all the others. These are his "bird dogs," and often they will do much of the preliminary sales work, leaving only the close and actual order-signing to the dealer.

Friends in the community, both in town and out, are always dropping in with tips on possible prospects . . . and Mr. Dwyer follows them up, every one. That's the best way in which he can show his appreciation. For they'd be hurt if he offered them a gift . . . after all, why should they accept anything for helping a friend?

Another reason back of this dealer's record is his cultivation of users, not only for new leads but also as prospects for new appliances. For Mr. Dwyer is one of those men who's never satisfied with selling one appliance if he can sell two or three.

On his call-backs, he talks new appliances . . . perhaps a range, if the customer has a refrigerator, or perhaps a new washer or hot water heater, or a milk-cooling job. Proof that this method pays out is that three-time customers are not at all a rarity on Mr. Dwyer's record books.

Firm Leases Space

NEW YORK CITY—Herman & Abe Weinstein, electrical appliance concern, has leased space at 874 Broadway here.

Macy's Introduces New Line of 7 Models Made By Crosley

NEW YORK CITY—Heading the "Supremacy" line of household refrigerators introduced recently by Macy's department store here is a 6-cu. ft. model with a hermetically sealed unit to retail for $109. Seven models in three groups make up the new line which is being made for the store by Crosley Corp.

"Thrift" group consists of a 4.3-cu. ft. model retailing for $99.50, and the 6-cu. ft. model selling for $109. Both have an enclosed evaporator, temperature control, and a hinged shelf and automatic light. The larger box makes 98 ice cubes at once, while the smaller makes 63 cubes.

"Master" model is a 6-cu. ft. special which retails for $129. It is fitted with a hermetic unit and also features a drawer-type crisper, 161 ice cube capacity, evaporator door, and chrome-plated hardware and trim.

"Deluxe" group consists of four models of 4, 5, 6, and 7.5-cu. ft. capacities, retailing at $119, $134, $149, and $169 each, respectively. In addition to the regular features of the other models, this group is equipped with an arm-opening door latch, two self-closing vegetable crispers, illuminated temperature control, sliding shelves, meat storage compartment of opaque white glass which also can be used for ice cube storage, and the "Storadrawer" non-refrigerated storage compartment in the lower portion of the cabinet.

All models conform in general appearance, but the higher priced models are trimmed with chrome. Doors are flush with the top of the box, and the bases are flush and black-trimmed.

Trade-in allowance at Macy's was not mentioned, but it was thought that the store would follow its past practice of adequate coverage, particularly in view of the cooperative refrigerator campaign of the Consolidated Edison Co. No change will be made, it is understood, in the terms on major appliances. The "For Cash Only" policy of the store has a tieup with the Morris Plan.

Utilities & Dealers Plan Joint Promotion

PORTLAND, Ore.—A cooperative promotional drive on electrical appliances in which Portland's two electric utilities will work hand-in-hand with dealers was announced at a recent meeting of more than 500 dealers and salesmen as guests of Portland General Electric Co. and Northwestern Electric Co.

Dr. G. W. Allison, national field representative for Modern Kitchen Bureau, spoke at the meeting, and explained how the dealers can "cash in" on the buying public's high degree of "electrical consciousness" built up largely by the promotional efforts of utilities and appliance manufacturers.

Other speakers were George H. Wisting, assistant general manager of Northwestern Electric Co., and James H. Polhemus, vice president of Portland General Electric Co.

Iowa's State Law on Lockers Would Set Temperature Limit

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products that may be stored in refrigerated lockers, the act further providing that "no article of food shall be stored in any refrigerated locker unless it is in a proper condition for storage and meets all the requirements of the pure food and sanitation laws." Storage of goods not intended for human consumption is prohibited, "except such items of animal or vegetable matter which may have been inspected and approved by the United States government."

A provision of the act which gives owners and operators of locker plants a lien on all property in his possession to cover charges and rents thereon and for the handling, keeping, and caring for the same was amended to read "reasonable" charges. As originally drafted, the bill read "lawful" charges.

"Every refrigerated locker plant shall be maintained in a sanitary condition and conducted with strict regard to the influence of such conditions upon the food handled therein and any licensee who fails to comply therewith shall suffer a revocation of his license," the act provides.

The act defines a refrigerated locker plant as "a location in which space in individual lockers is rented to individuals for the storage of food and which is artificially cooled for the purpose of preserving such food."

Proposed N.Y. Law Aimed At 'Discount' Selling

ALBANY, N. Y.—A bill to curb "loss leader" merchandising by prohibiting below-cost advertising or sale of goods at wholesale or retail passed the Assembly here March 14 by a vote of 122 to 22. Its chances of passage in the Senate are regarded as problematical.

Similar bills have been introduced here in other years, but none of these has ever been reported out of committee. The current proposal is one of several such measures now pending in state legislatures throughout the country in a new wave of price legislation resulting from the efforts of small independent retailers.

Sponsored by Assemblyman George B. Parsons, Syracuse (N. Y.) Republican, the proposed New York statute stipulates that retailers must sell goods at not less than a 6% markup and that wholesalers must place at least a 2% markup on their merchandise. It provides further that when two or more articles are sold at a combined price the price of each item shall be governed by the provisions of the measure.

Sales to consumers, retailers, and wholesalers which cannot be justified by existing market conditions within the state shall not be used as a basis for computing costs, the bill states.

Terms of the bill would not apply where merchandise is sold in bona fide clearance sales, if advertised, marked, and sold as such; where perishable merchandise must be sold promptly in order to forestall loss; where merchandise is imperfect or damaged, or is being discontinued, and is sold as such; where merchandise is sold upon final liquidation of a business, or where it is sold for charitable purposes or to relief agencies; and where the price of merchandise is made in good faith to meet competition.

Violators of the proposed ordinance would be guilty of misdemeanor and subject to a fine of not more than $500 or imprisonment for not more than six months.

Skinner Elected President Of Niagara League

BUFFALO—Merrill E. Skinner, vice president of Buffalo, Niagara & Hudson Power Corp., has been elected president of the Electrical League of the Niagara Frontier.

Other officers elected at the league's annual meeting were: Robert D. Glennie and R. W. Mitchell, vice presidents; Richard Wahle, secretary and treasurer; Weldon D. Smith, executive committeeman - at - large; and Karr Parker, president ex-officio of the executive committee. Samuel S. Vineberg was reappointed secretary and executive manager.

Air-Cooling Installations In N.Y. For February Show Improvement

NEW YORK CITY—Air-conditioning installations in the New York metropolitan area during February jumped more than 50% in number and well over 100% in capacity above installations for the previous month, the 92 systems or units installed having an aggregate capacity of 2,951.50 hp., as compared to the 61 installations with 1,245.75 hp. reported for January.

Systems installed in various exhibits at the New York World's Fair led all other classifications in both number and capacity, with 27 installations totaling 1,144.25 hp. Despite this addition to installations in the Queens territory, Manhattan remained on top of the heap with 51 installations and 1,686.25 hp., compared to the 31 systems with combined capacity of 1,212.75 hp. installed in Queens.

Seven installations with total capacity of 24 hp. were made in Brooklyn, and three jobs, with capacity of 28.5 hp., were installed in the Bronx.

Tabulation of the February installations, by business classification, follows:

Bank	1
Barber shops	2
Club	1
Funeral homes	2
Hotel public rooms	2
New York World's Fair exhibits	27
Offices	8
Restaurants	8
Showrooms	9
Department stores	3
Retail stores	24
Miscellaneous commercial	3
Candy manufacturer	1
Miscellaneous industrial	2

Appliance Center Is Opened In Baltimore

BALTIMORE—Electric Appliance Center has opened for business at 736 West North Ave. here. Electric refrigerators, including Westinghouse and General Electric units, are being featured, in addition to other major electrical appliances.

Appliance Dealer Ties In With Frozen Foods Store and Both Profit

(Concluded from Page 1, Column 1)

was distributing frozen foods in the city, Simon Halle, proprietor of the appliance store, proposed the reciprocal display plan which called for a showing of the frozen foods in all refrigerators on the floor which had compartments for them and a display of one of his refrigerators in the retail store of the dairy.

The arrangement soon proved beneficial for both the dairy and the refrigerator dealer. A sign on the refrigerator in the dairy store invites people to look in the refrigerator and examine the various products and the low-temperature refrigeration facilities for keeping them in the home.

In the appliance store, when a prospect is shown a refrigerator the salesman always points out the compartment where the frozen products can be stored at the proper temperature, and at the same time he shows one of the packages and gives a brief outline of the frozen food products available and their advantages.

This dealer has taken another important step in the campaign to interest the prospect in the advantages of frozen foods—and in the proper refrigeration facilities for storing them. In the store's model kitchen are given demonstrations in cooking the frozen foods.

While instructions on the packages tell how to handle these foods, the actual demonstration of the proper methods tends to increase confidence in the merchandise, this dealer has found, and it also creates buying interest in the refrigeration for keeping it.

Kendrick Joins Brown

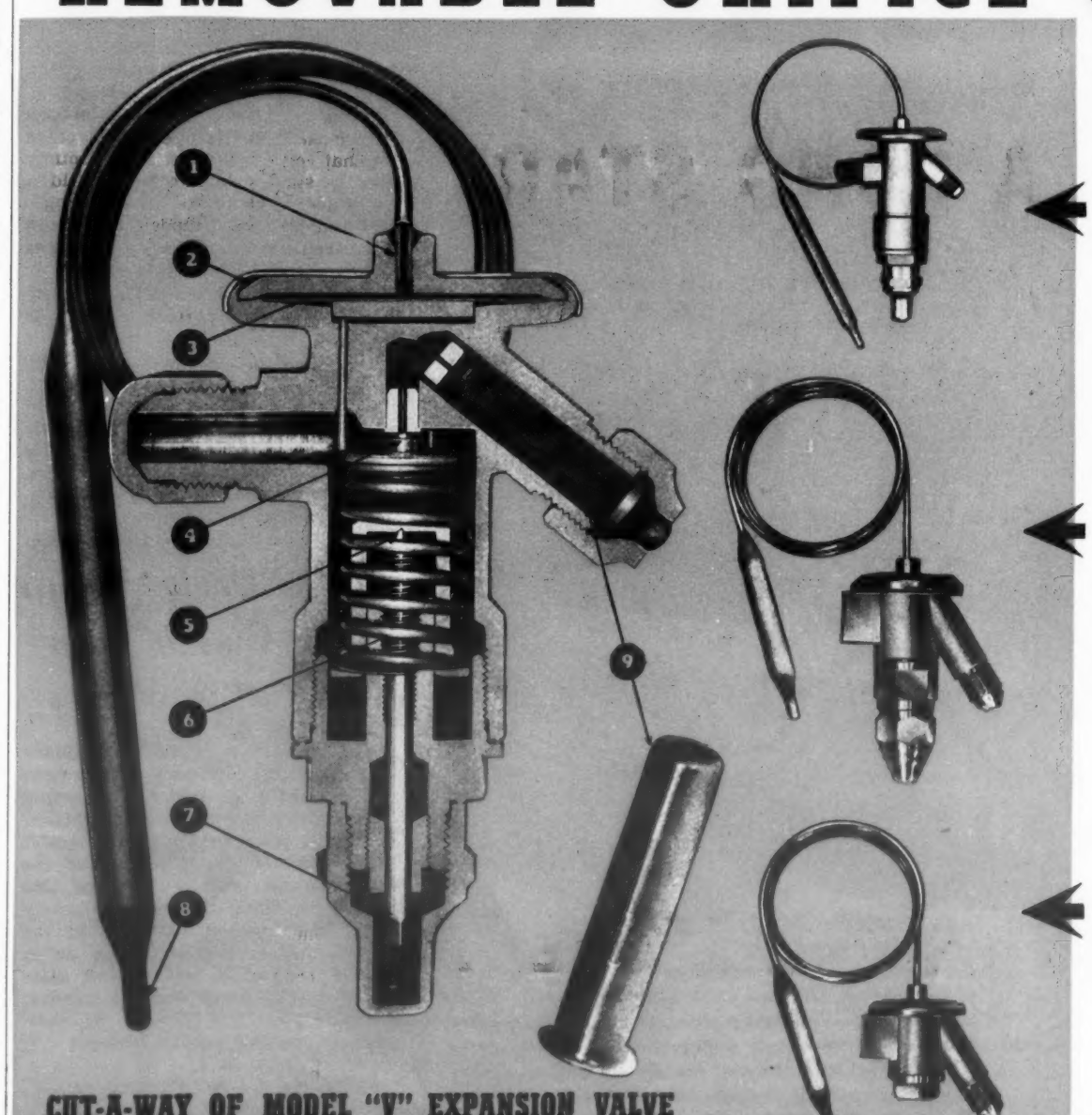
FLORENCE, S. C.—Pete Kendrick has joined the sales force of Herb Brown, General Electric dealer here.

Safety Sealed

EACH PEERLESS VALVE COMES TO YOU FACTORY NEW IN TAMPER PROOF METAL CONTAINERS

PEERLESS VALVES

REMOVABLE ORIFICE CARTRIDGE



CUT-A-WAY OF MODEL "V" EXPANSION VALVE

1. CAPILLARY TUBE CANNOT PULL OUT as it is threaded and soldered into valve cover.
2. COVER CANNOT LEAK OR WORK LOOSE because it is rolled into the valve body to form a lifetime mechanical joint, then solder sealed.
3. DIAPHRAGM STANDS TREMENDOUS PRESSURE without distortion or rupture as it is made of highly sensitive spring temper phosphor bronze.
4. TIGHT CLOSING FULL OPENING ORIFICE by using a hard stainless steel ball and soft stainless steel seat bushing. Ball type requires minimum spring lift.
5. PIVOT IN TOP OF SPRING CUP relieves friction and prevents spring from turning during adjustment.
6. EXTRA LARGE SPRING HAS MINIMUM PRESSURE BUILD-UP actually less than one pound. This assures extreme sensitivity and smooth "Velvet Action."
7. ADJUSTING SCREW STEM—Most easily and accurately adjusted valve on the market. One complete turn of adjusting screw gives approximately 1° superheat change.
8. BULB IS SEALED AFTER CHARGING with steel ball and then soldered. Semi-liquid charge maintains control in bulb at all times.
9. ORIFICE CARTRIDGE—Nine different sizes having a capacity range to take care of smaller as well as larger jobs.

BY USING THE PROPER SIZE ORIFICE CARTRIDGE YOU CAN MATCH THE MODEL V OR VS VALVE TO THE COIL AT THE TIME OF INSTALLATION.

MODEL V THERMAL EXPANSION VALVE

WITH INTERCHANGEABLE ORIFICE CARTRIDGE

For those "hard to handle" jobs, the new Peerless Model V is pacing the field. It combines highly successful past performance with advanced engineering. It is now possible to match the valve to your equipment by using the PROPER SIZE ORIFICE CARTRIDGE.

MODEL VS THERMAL EXPANSION VALVE

WITH INTERCHANGEABLE ORIFICE CARTRIDGE

For those fussy small jobs, choose Model VS Valves. They are ideal for places where space is at a premium, yet requiring a man-size performance. The price offers a great saving.

Use The Proper Size Orifice Cartridge.

MODEL VN THERMAL EXPANSION VALVE

NON-ADJUSTABLE SUPERHEAT

Peerless Model VN Valves conform to specifications for factory-engineered refrigeration products. Maximum coil efficiency is assured by a predetermined superheat. It cannot be adjusted in the field.

MODEL VA AUTOMATIC VALVE

Peerless has designed the Model VA Valve for small evaporators, beverage coolers and jobs of similar capacity. Its fundamental purpose is to feed refrigerant into the evaporator in correct proportions to maintain maximum evaporator efficiency without frostback to the compressor unit. The flow of the refrigerant is stopped during the off-period.

WE CAN MAKE IMMEDIATE DELIVERIES

ASK YOUR JOBBER FOR DETAILS, OR WRITE FOR OUR CATALOG

PEERLESS of AMERICA, Inc.

GENERAL OFFICES — 1200 W. 35TH STREET — CHICAGO

NEW YORK FACTORY — 47-10 30TH STREET — LONG ISLAND CITY

PACIFIC COAST FACTORY — 1013 S. MAIN STREET — LOS ANGELES, CALIF.

SOUTHWEST FACTORY — 1310 N. HARWOOD ST. — DALLAS, TEXAS

EXPORT DIVISION — P. O. BOX 516 — DETROIT, MICH., U.S.A.

Specialty Selling Methods

Radio Advertising & Personal Follow-Up on Inquiries Bring Results From Farm Market

GREELEY, Colo.—Radio advertising, coupled with a type of high-speed long-distance selling which would have been impossible a few years ago, has been a factor that allows Stapp Maytag Co., Kelvinator refrigerator and general appliance dealer here, to profitably cover a far-flung rural territory surrounding this northern Colorado trading center.

As radio has been found by far the most satisfactory means of reaching the store's widely scattered prospects, the company has used a program of two broadcast announcements daily, at 6 and 10:30 a.m., over KFKA, local 1,000-watt station.

50 MILES ON ONE CALL

Although Greeley is a wide-awake city of 14,000 and a good market, R. T. Stapp, owner and manager of Stapp Maytag Co., prefers to concentrate on the outside territory, and his salesmen call on prospects 15 or 50 miles away as casually as they do on those just a few blocks away. The network of oiled and paved roads covering this region makes this type of long-range salesmanship possible.

While some sales are made in villages, most prospects are found on farms. And, granted crop conditions at all favorable, farmers make better refrigeration prospects than city folk, Mr. Stapp believes.

Farmers really need refrigeration, he points out, as they get to town so seldom and are forced to keep perishable goods over comparatively long periods of time. But farmers are economical, too, and that's why the radio announcements stress this phase of electric refrigeration.

BRINGS INQUIRIES

The radio advertising built up a favorable sales background for the store, and produces some direct inquiries. These inquiries are followed up, regardless of what part of the territory they come from, within 48 hours.

This does not usually mean that an extended trip is required every time that a prospect is uncovered, for the common procedure is simply to include the new prospect in a series of calls already scheduled in that particular section. In this way, Stapp salesmen knock off several prospects in one trip.

Equally rapid service is rendered on service calls or on collections which necessitate personal treatment.

Salesmen work from a large prospect file, into which go leads from radio advertising, users' tips, or any other sources. This file also provides the key to economic routing of the calls.

Some of the store's farm customers have been handled on the basis of a spring down payment, with the balance due in one lump sum in the fall, when crop money comes in. The most common arrangement, however, is 10% down with the balance payable in 18 months or less.

Mr. Stapp has recently acquired a store in Ft. Morgan, in northeastern Colorado, where he plans to merchandise refrigerators and appliances under a sales set-up similar to that employed by the Greeley store.

Georgia Power Assures Support of Salesmen's Wives In Sales Drive

ATLANTA—Salesmen for Georgia Power Co. are going to win prizes in the company's spring electric refrigerator sales drive—or they'd better not tell their wives about it!

For, to make the campaign a sort of "family" affair, the company is presenting to the wives of winners prizes equal to half those won by their husbands.

Idea back of this, of course, is that if she stands to win a cash prize if her husband should exceed his quota in the drive, which began March 13 and runs until April 28, the wife will see to it that he stays on the job and sells.

Cash prizes for salesmen and district managers totaling $1,000 are being offered in the campaign.

'See For Yourself' Roaster Drive Urges

"Madam, have you tried "Easier Cooking—Easier Living?" The young saleslady practices up on her story which she is taking from the Modern Kitchen Bureau's basic selling guide on electric roasters. The signs on the counter are also among the sales aids being provided by the Bureau.

* * *

Dealer Calls His Store 'Home Planning' Bureau

BOULDER, Colo.—Offering advice on home planning for the medium-priced home opens the way for appliance and furnishings sales for the Home Planning Bureau, appliance dealer here. The service has made the job of actual selling a comparatively easy one.

The company's biggest market for refrigerators and other lines is among families in homes costing $5,000 and under, it has been ascertained. These families, reasons this dealer, often feel the need of expert service on home planning, yet hesitate to call in an architect, or an interior decorator, for fear that the cost will be prohibitive.

Recognizing the fact that many families buy appliances and home furnishings, not as isolated items, but as units in a much larger plan, the company advertises home planning of exterior and interior finishes and furnishings. Consultations are arranged with customers in their own homes without cost or obligation. The store is ready, for example, to plan a new kitchen, or re-plan an old one, for a family or home of any size.

Mrs. Molly Manning, home economist of the new business, explained how the promotion plan produces sales. "If families come to us for expert aid, and are given it, we know that mighty little salesmanship is going to be required to secure our full share of the business," she says.

The store, conducted by Mrs. Manning and George Jump, furnishings expert, deals in refrigerators, ranges, and washing machines, as well as floor coverings, wall papers, Venetian blinds, weather-stripping, and insulating materials.

Virginia Utility Reports Show Gain In Sales For First 2 Months

ALEXANDRIA, Va. — Appliance dealers in the territory of Virginia Public Service Co. sold 279 household refrigerators during the month of February, the utility's reports show, while washers came second in the sales parade with a total of 209 units sold during the month.

In third position, far back of the leaders, came electric range sales, with a total of 56 units. Unit sales of other appliances were as follows: water heaters, 13; ironers, 6; commercial refrigeration systems, 5; water systems, 5.

Unit total for the month was 573; total dollar volume was $78,833.

Major appliance sales in this territory for the first two months of 1939 were well above sales for the corresponding period of 1938. During the first two months of this year, the utility's dealers sold 496 refrigerators, 106 ranges, and 30 water heaters, or a total of 632 units. During the same two months last year they sold 422 refrigerators, 95 ranges, and 17 water heaters.

Trilling & Montague Hold 'Exposition' In Scranton

SCRANTON, Pa. — Trilling & Montague, Norge distributor, recently held a 3-day exposition, open to the public as well as to the trade, at its warehouse display rooms here.

Keller Spurs Roaster Drive In Northeast

BOSTON — Gospel of Modern Kitchen Bureau's "Golden Age" Electric Roaster Campaign for 1939 is being spread throughout New England these days by G. W. Keller, field representative of the bureau. At recent meetings here and in Worcester, Mr. Keller presented details of the plan to interested dealer and utility representatives.

The Boston meeting was held at the University club under the direction of F. X. Fitzpatrick of Graybar Electric Co.'s local office. L. A. Fiorani, from New England Power Co.'s home office, and the company's sales managers from Franklin, Quincy, Gardner, Revere, Lowell, and Haverhill, Mass., and Providence, R. I., were among those present, as were Stanley Wilson, merchandise manager, and S. R. Keyes, purchasing agent of Boston Edison Co., and W. G. Keay and Mr. Schloman of Associated Gas & Electric Co.

The Worcester meeting was arranged by Taylor Calhoun, New England representative of Swartzbaugh Mfg. Co., and took place at the offices of Worcester County Electric Co. Utility executives, salesmen, and home service girls, as well as distributor and department store representatives, attended.

Philadelphia Salesmen Vie For 'Fair' Day

PHILADELPHIA—Cashing in on the interest attendant to the soon-to-open New York World's Fair is a contest for commercial salesmen now being sponsored by Philadelphia Electric Co.

In addition to being "hung on" the World's Fair as a theme, the contest offers to the two top salesmen a "free full day at the fair," (value, $20). Winners can go any day they choose—and on company time.

Salesmen's interest in the contest is stimulated by having the map of the Fair grounds localized by naming a concert hall after Philadelphia Electric's director of suburban retail sales, the surf-casting exhibit after the director of retail promotion, etc.

In the contest, $75 of commercial cooking revenue and $75 of commercial lighting revenue is "railroad fare" from Broad St. to the World's Fair station, and $25 of revenue in each classification is "admission fee to the fair grounds."

Admission to each building is "paid" by securing 3% of the salesman's quota for cooking and for lighting, and upon "entering" each of four out of 40 "buildings" en route, bonuses are paid. Finally, when commercial cooking sales are made, a special prize of from 15 cents to $2.50 per kilowatt is paid for appliances ranging from electric coffee makers to electric bake ovens.

Employe Tips Bring Sales To Chicago Utility

CHICAGO—Fifty leads on appliance prospects were turned in by Commonwealth Edison Co. employes outside the company's merchandise sales department during the first 20 days of February. Seven of these tips have already resulted in sales, and 30 of the names are still on the "potential purchaser" list.

A NEW BOOK
BONDERIZING
A PARKER PROCESS THAT HOLDS PAINT TO STEEL AND RESISTS RUST
BONDERIZING PROTECTS
DESCRIBING BONDERIZING AND ITS LATEST DEVELOPMENTS

Every year sees new advances in scientific methods of rust control. This new book outlines the most recent developments in a modern process for finish betterment. It describes the latest improvements, that result in greater efficiency, lowered installation and operating costs, and methods of application that widen its scope of usefulness to include hot or cold rolled steel, as well as zinc coated or die-cast surfaces.

This book indicates the hundreds of products to which Bonderizing is applied and lists some of the world known corporations that use it as a necessary step in their finishing systems.

Every factory executive or technical man responsible for metal finishing should have a copy. If you have not investigated Bonderizing recently, send for your copy.

PARKER RUST PROOF COMPANY
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PARKER Processes CONQUER RUST
BONDERIZING • PARKERIZING

Sales of Refrigerators By Utilities Showed Big Drop In 1938

NEW YORK CITY—One hundred and thirty power companies sold 109,251 refrigerators in the United States in 1938 for an average of eight units per 1,000 consumers, it is revealed by a composite table of appliance sales and promotion statistics prepared by McGraw-Hill Publishing Co.'s Electrical World.

Utility refrigerator sales for 1938 were far below those of 1937, the table reveals, total for the latter year being 198,160 units.

Refrigerator sales by dealers in the various utility territories, as estimated by the power companies, totaled 545,844 units in 1938, as compared with 761,540 in 1937.

Proportion of appliances sold last year by utilities and by local dealers, as reported by the utilities, is shown in the following table:

Appliance	Utility Sales	Dealer Sales
Refrigerator	11%	89%
Range	45%	55%
Water Heater	61%	39%
Washer	9%	91%
Ironer	15%	85%
Vacuum Cleaner	10%	90%

For accuracy in this table, utilities which did not report both their own sales and dealer sales were not included in the compilation.

Taking the country by sections, the following division of refrigerator sales is shown in the tabulation:

Northeast (north of the Ohio river, east of the Mississippi river): power companies—66,928 in 1938, 121,379 in 1937; dealers—218,415 in 1938, 343,724 in 1937.

Southeast (south of Ohio river, east of Mississippi river): power companies—16,363 in 1938, 35,687 in 1937; dealers—78,352 in 1938, 108,288 in 1937.

Central (west of Mississippi river, east of Rocky Mountains): power companies—21,055 in 1938, 32,495 in 1937; dealers—121,369 in 1938, 147,057 in 1937.

Western (Rocky Mountains to Pacific Coast): power companies—4,905 in 1938, 8,599 in 1937; dealers—127,708 in 1938, 162,471 in 1937.

Fifty-eight of the utilities are in the Northeast, 25 are in the Southeast, 30 are in the Central section, and 17 are in the Western division.

Air-Cooled Thoroughbred Wins Races 'In A Breeze'

COLOMBO, Ceylon—"Railbirds" at the famous Ceylon Turf Club here are betting air-conditioned horses win, place, and show since it was discovered that air conditioning horse stalls is an effective remedy for "dry sweating"—energy-robbing horse ailment—and the air-cooled bangtails are breezing home in front of the field.

Dry sweating is caused by exertion in the hot, humid climate of Colombo, and leads to a sharp rise in the body temperature of the race horse. Only cure known previously was the costly, time-wasting practice of sending the ailing horses to Nuwara Eliya, a hill station 6,000 feet above sea level and 100 miles by rail from the Colombo course.

After long experimentation on drugs and medicines, Capt. J. E. Barnes, veterinary surgeon of the racing club, decided the best solution was to maintain climatic conditions in the stables similar to those in the hills.

This led to a recommendation by an American-trained engineer, Cecil F. Carlton, Carrier Corp. representative at Ceylon, that air conditioning be tried. A portable room unit was installed in an ordinary horse stall.

Horses suffering from dry sweating showed immediate improvement, it was reported. Koa, three-year-old thoroughbred mare, was placed in the air-conditioned stall and 15 days later won the famous Watagoda Plate. One other horse given the same treatment took another first on the track.

Captain Barnes said that "dry sweating" was the natural result of the body's attempts to dissipate the heat of metabolism by other means when evaporative cooling on the surface of the skin is prevented by high humidity. The ailment is characterized by a rise in body temperature of the horse, accompanied by a sharply increased rate of perspiration known as "blowing."

Happiness Returns To Happy Hollow Bar When Air Conditioning Brings Back Summer Trade

ST. LOUIS—Air conditioning is credited as being responsible for a 40% increase in summer business in the Happy Hollow bar and night club here by A. M. Roufa, manager.

In designing the system, M. A. Rogers, president of Sehmann-Wright Co., air-conditioning and refrigeration firm, was faced with the problem of overcoming St. Louis' terrific summer heat.

Last year, Mr. Roufa sat in his club and disconsolately watched "after-the-ball-game" customers look in and walk away. The interior of the Happy Hollow bar was as uncomfortably hot as a steam room.

The Happy Hollow was very unhappy. Whereas in May there was an average of 840 drinks served every afternoon, this average dropped to less than 100 in June and July. More than 50% of the company's business had been coming from the club, and this trade was evaporating with the heat.

BUSINESS VANISHED

Night business likewise vanished. The Happy Hollow night club, with accommodations for 300 customers at about 75 tables, poked along by serving a few iced drinks on the hot summer evenings.

This year, Mr. Roufa is eagerly awaiting the coming of summer, for then he expects to stand by the door, rubbing his hands, and smiling greetings to hundreds of parched St. Louisans crowding into the cool, refreshing atmosphere of the Happy Hollow to escape the withering heat of the streets.

VERSATILE SYSTEM

Happy Hollow is air conditioned by a new type of system versatile enough to cope with varying situations during the day and night. It is an arrangement controlled by thermostats in two parts of the store, one in the bar and one in the night club.

An overhead traveler duct, with six louvered grilles each equipped with a damper control, distributes the conditioned air, cooled to 70° F. at night and 74° in the daytime.

Each morning during the summer, the system is designed to draw in enough cool outside air to last for the first three hours of business, which is quite light. Then the 74° air is distributed until 3 o'clock in the afternoon, when the 70° air is turned on.

Humidity is maintained between 50 and 55%, judged most comfortable for the concentrated crowds in the bar and club.

To provide a quick, effective means for ridding the night club of smoke, a ceiling exhaust fan was installed.

After the system has been thoroughly tested in the No. 1 downtown bar and club, other units in the Happy Hollow group around town may be air conditioned.

Baton Rouge Firm Moving

BATON ROUGE, La. — Home Appliance Sales, Inc., Kelvinator distributor here, will move to new and larger quarters on April 1. B. C. Nabers is president of the firm.

FREE PERSONNEL SERVICE

The individual qualifications of each R.A.C.I. graduate are recorded in a convenient form for your inspection. Simply let us know the type of man you need, and we will gladly send the personnel records of our graduates in your neighborhood who we believe measure up to your requirements.

Realizing that distributors, dealers, and contractors want PRACTICAL CRAFTSMEN—*NOT* "Textbook Technicians," we have established a New Standard of Industrial Training—a training program that has been planned and is actually supervised by a manufacturer-appointed committee of engineers and executives. With their help, we have created A New Type of Craftsman, trained as the industry wants him trained—to handle any problem that he may encounter out in the field while working for you.

Before receiving his diploma, this New Type of Craftsman now must complete 1000 hours of theoretical training plus FOUR SOLID WEEKS of intensive shop work in our new and modern laboratories in Chicago. He has had to install, dismantle, rebuild and service *ALL* MAKES and TYPES of Refrigeration and Air Conditioning Equipment. He knows every phase of heating, ventilating, and cooling . . . the theoretical as well as the practical side.

Refrigeration and Air Conditioning Division of

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Air Conditioning

Conditioning Improves Work & Sales, Survey of Employes & Bosses Shows

YORK, Pa.—An extensive analysis of air conditioning as an influence affecting employe morale and thereby improving employe relations and efficiency has been conducted for York Ice Machinery Corp. and reported at length in an ultra-modernistic book, Atmosphere & Efficiency.

The analysis was made in the form of a nation-wide survey by the Psychological Corp. and the Hooper-Holmes Bureau, Inc., independent research organizations.

Numerous questions were put to employes and employers separately to obtain a true picture from both viewpoints.

Air conditioning makes work less tiring on hot days, affirmed 94% of the employes interviewed in the survey. All but 5% said most of their fellow-workers favored air conditioning, and 83.6% declared air conditioning made their fellow-workers less irritable and easier to get along with.

To the question, "Can you, with air conditioning, do more work on hot days?" 90% of the employes answered, "Yes!"

"Is your boss more pleasant?" produced a 58.8% affirmative response.

As for management's viewpoint, 94.6% of the executives interviewed stated that air conditioning increases the efficiency of their employes, 77% estimated that it increases the amount of work done, and 93% declared that air conditioning reduces hot weather fatigue.

"Management Speaks on Air Conditioning" is the section dealing with employers' answers and comments reported in the investigation. Subdivisions are the "selling establishments," including department stores, retail stores, beauty and barber shops, restaurants, bars, and hotel dining rooms, and the "non-selling establishments," including office buildings, hotels, and banks.

Of the selling establishments, 42.6% have year-around air conditioning, and 56.4% have summer air conditioning only. Of the non-selling group, 70.6% have year-around installations, and 26.4% have summer only.

Only 1% of the former group and 1.5% of the latter indicated that air conditioning does not increase the efficiency of employes. Reduction of hot weather fatigue was named by 93.2% of the whole management classification as the primary benefit of air conditioning in regard to employes' work.

Employes favor air conditioning, reported 96.6% of management, another 3% declaring that employes find it "all right." Employes, said 93.2%, are happier and more contented with air conditioning.

"Do employes handle customers better?" To this question, 86.4% of management said "Yes," and 12.8% reported no difference. The customers like air conditioning, according to 95.8% of management.

Sixty per cent of management asserted that air conditioning has brought them new customers. In connection with the question of whether air conditioning has been a profitable investment, 86% of management said that it has, 3.4% said that it is too early to tell, 2.3% said that it has not, and 8.3% gave no answer.

Employes were grouped under the same two headings, those working for selling establishments and those working for non-selling concerns.

When asked if they would prefer an air-conditioned place if they changed positions, 89.1% of the employes said they would, 3.7% said it would make no difference, and 6% said they would not particularly prefer air conditioning.

Customers favor air conditioning, said 95.4% of the employes, while 81.9% said they are less irritable and easier to serve. The customers remain in the place of business longer, according to 79.3% of the employes, and, declared 54.8%, buy more in the air-conditioned atmosphere.

Air Conditioning Needs 'Stabilization,' Contends Natkin; Wants Association

(Concluded from Page 1, Column 4)

gineers, and owners, and that will take into consideration climatic conditions in various parts of the country.

5. Co-ordination—The work of local associations, councils, bureaus, and air-conditioning groups in many cities may be correlated by a national clearing house for industry information. Activities of the local groups may be strengthened in this manner.

STRONG LOCAL GROUPS

6. Organization—Mr. Natkin believes that the strength of the national group lies with the strong local. For this reason he would like to see all firms engaged in the air-conditioning trade belong to the nearest local group, and the local become part of the national as a body.

7. Membership—Mr. Natkin believes firms belonging to the association should be confined to "the legitimate air-conditioning business," whether dealers, distributors, factory branches, or other types of sales organizations. Mr. Natkin points out that there are 22 firms engaged in "air conditioning" in Kansas City, of which perhaps 12 have any right to be considered in the air-conditioning business.

FINANCING PLAN

8. Financing—Plan advanced by Mr. Natkin for financing both the local and national air-conditioning associations is a pro-rata assessment of 1% to be added to all contracts taken by the member firm. Half of this amount, or ½%, would support the local and the other ½%, would support the national.

At the present time the Air Conditioning Bureau of Kansas City imposes a charge of "not to exceed 2%" on business done by member firms, but Mr. Natkin believes this amount could be greatly reduced if a strong national group was established.

Answering the question, "What's in it for me?" which is asked by the heads of many firms interested in the new association, Mr. Natkin outlined a number of benefits and advantages.

1. Stabilization of what is now a "fly-by-night" business. Mr. Natkin believes that competitors in any given area can "guarantee" the work of any firm awarded an air-conditioning contract and thereby assure the public, the architect, and the engineer of a thoroughly satisfactory installation. It is important that association members become known as such and that the public be impressed with the fact that the association member is a legitimate business man who is in a position to perform a satisfactory service to any client.

SOLVING PROBLEMS

2. Industry problems may be worked out jointly, with cooperation going on between cities, thereby saving a great deal of time and expense. At present the industry is working out any number of problems at different points, when we might all be working together, Mr. Natkin said.

3. Assistance in the training of mechanics who install air conditioning. Many sections of the country do not have an adequate supply of skilled installation mechanics, and Mr. Natkin believes the national association should work out a program of cooperation with the trade unions which will assure good workmen on every installation.

4. Co-ordination of local code problems dealing with city, state, and fire underwriters' regulations which govern the air-conditioning industry. Mr. Natkin believes that the national association should assist the cities interested in getting satisfactory codes.

5. An educational and promotional program would be of benefit to all firms engaged in the business, Mr. Natkin believes.

NEEDS STABILIZATION

6. New firms entering the business would be given a standing by becoming members of the local and national associations. Firms who "do not belong in the air-conditioning business" should be kept out of the association, according to Mr. Natkin.

"My thought is that the air-conditioning industry needs stabilization at the present time," Mr. Natkin said. "The public wants to buy air conditioning and the manufacturers are interested in selling equipment. There is no reason why the distributor, who is caught between these two desires, should not help to clean up his own industry and put himself in a position where he can make some money."

Amateur Camera Fans Find Cooled Darkroom In Photographic Shop a Haven on Summer Days

ST. LOUIS—Installation of an air-conditioning unit in Kay's, photography center here, has converted a set of finishing rooms maintained for amateur photographers' use from "white elephants" to "business boomers."

Kay's does an extensive business in all branches of photography, explains President E. A. Scheer, and one of the chief attractions is a group of finishing rooms in which any customer may do his own developing and printing, paying only the cost of materials and a small monthly fee.

Every summer, Kay's was accustomed to taking a drop of 75% in this amateur trade. Warm weather would send the laboratory temperature up to around 80° F. where it would hover most of the day, and nobody felt like working in that heat.

The company also lost money through swift deterioration of film and developing chemicals exposed to the effects of excessive heat. Thus, from May to September of each year, the finishing rooms became bothersome liabilities.

Now a Carrier "Weathermaker" has been installed, sending a fresh stream of cooled air directly into the finishing rooms, and then out of the building, taking with it chemical odors.

The temperature in the finishing rooms is maintained at 72° F., comfortable enough to increase employe efficiency and amateur trade, and safe enough to preserve the emulsions and chemicals.

Mr. Scheer credits the air-conditioning system with eliminating the heavy seasonal drop, believes that it is the best summer advertising asset of the store, and asserts that the average time now spent by amateurs in the finishing rooms is two hours, meaning sales of more materials.

There's More Opportunity with the DELCO-FRIGIDAIRE

Complete Heating and Air Conditioning Line

Built and Backed by GENERAL MOTORS GM

Get into the Swing of Year-'Round Full-Line Selling!

■ The records prove that dealers with a complete line make more money. It's easy to understand why:

If you are an air conditioning dealer only, your business peaks in the spring. If you're a heating dealer only, your business peaks in the fall. But if you are a Delco-Frigidaire dealer with the complete line of both automatic heating *and* air conditioning products you have a 12-months-a-year business! The complete Delco-Frigidaire heating and air conditioning line provides an outstanding opportunity for a profitable year-'round business because the products form a natural, logical combination with a practically unlimited market!

Now is the Time to Start!

Plan now to guard against seasonal slumps, provide year-'round employment for your salesmen, increase your total volume of business and make more money for yourself. Consider the big advantages of the complete Delco-Frigidaire line—backed by General Motors' well-known name and reputation for quality products. Consider the whole-hearted, intelligent cooperation offered to franchised dealers—training schools for your salesmen, effective selling tools, enlarged field organizations to help you solve sales and technical problems, leads derived from powerful advertising in national magazines and local newspapers, and many, many other helps.

Get all the facts. Mail coupon now!

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AIR CONDITIONING & HEATING PRODUCTS

Unit Air Conditioners · Portable Air Conditioners · Commercial Air Conditioning
Oil Burners, Stokers, Oil & Gas Boilers · Oil & Gas Winter Conditioning Units

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Please rush complete information regarding a Delco-Frigidaire franchise backed by General Motors.

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MANHATTAN V-BELTS

Customer Builders....

Trouble-free drives because they are built for steady service. Exclusive construction—endless whipcord strength member completely floated in rubber and placed in the neutral axis—resists destructive internal heat, stretch and side-wear. Thus, they remain flexible, strong, smooth running, noiseless.

THE MANHATTAN RUBBER MANUFACTURING DIVISION
of Raybestos-Manhattan, Inc.
45 TOWNSEND STREET PASSAIC, N. J.

Distributor-Dealer Doings

Linderme and Zurcher Form Own Firm

MIDDLETOWN, Conn.—Linderme & Zurcher, Inc., formed through the partnership of two longtime General Electric appliance merchandisers, has been enfranchised as the exclusive G-E dealership here by Orkil Electric Co., G-E distributor of Hartford, Conn.

E. G. (Ernie) Linderme entered the G-E picture 10 years ago as manager of a dealership in Middletown. Soon he became manager of the distributorship's retail store in that city. This store did such a splendid job on the entire G-E line, and particularly on commercial equipment, that two years later Mr. Linderme was made commercial manager of Orkil Electric Co.

Z. W. (Gus) Zurcher has been a G-E salesman in Connecticut for 11 years, and during that time has personally sold more than a quarter of a million dollars worth of General Electric appliances. A charter member of the G-E's Topper club, Mr. Zurcher became manager of Orkil Electric Co.'s Hartford retail store a year ago.

Tower-Binford Dealers Are Banqueted

RICHMOND, Va. — Tower-Binford Electric & Mfg. Co., Crosley distributor in Virginia and North Carolina, last week sponsored a meeting and banquet for local dealers at the John Marshall hotel, culminating a series of similar meetings which have been held recently in various cities throughout the company's territory.

Billy Burke, sales manager of the distributorship, was master of ceremonies. Frank J. Hogan, Jr., Crosley district manager, spoke on the history of Crosley Corp. and discussed present-day merchandising of electric refrigerators and other appliances.

Dealer Explains Why He Returns To One Line

HARRISBURG, Pa.—Troup Bros., local music store and appliance dealership, has discontinued all lines of refrigerators except General Electric, and now handles G-E exclusively.

Explanation of this change in policy was offered in a letter by L. A. Troup: "Relative to electric refrigeration, it has been our policy in the past to handle three to five different makes of refrigerators, with the result that we were compelled to establish an expensive repair department in order to keep most of these boxes in repair.

"For several years now it has been our earnest desire to confine our refrigerator business to only one make of refrigerator. It was naturally a slow process, as we had sold hundreds of these different makes and we had to protect ourselves from creating dissatisfaction among our customers which would ultimately result in excessive repossessions and loss of goodwill.

"We believe we are now in a position whereby we can eliminate from our floors all makes of refrigerators with the exception of General Electric."

City of Manchester, N. Y. Honors A. L. Frank

MANCHESTER, N. H.—Manchester's Chamber of Commerce recently presented Arthur L. Frank of A. L. Frank & Co., local refrigeration dealership, with a testimonial "in appreciation of his untiring efforts for the common good of our city during many years, especially during the last 20 years in which almost continuously he has been active in the Chamber of Commerce either as president, treasurer, national councilor, or director."

Presentation was made at the C. of C.'s twenty-first annual meeting and banquet, which was attended by more than 250 of the city's leading figures.

Golden Is President Of Essex League

NEWARK, N. J.—Ben Golden, president of Eastern Electrical Supply Co., was elected president of the Essex Electrical League at a recent meeting of the league's executive committee.

Mr. Golden succeeds Lester P. Philp, who resigned when he left his position as division manager of Westinghouse Electric Supply Co. to accept an offer from some New York City firm outside the electrical industry.

William Shaw, president of Shaw Electric Co. here and a former city commissioner of Montclair, N. J., was elevated from treasurer to vice president of the league. James H. Stapleton is secretary of the league which is composed of N. J. retailers.

A. E. Bailey Now Heads Bailey-Wagner Co., Springfield Firm

SPRINGFIELD, Mass.—Albert E. Bailey, former treasurer of Bailey-Wagner Co., electrical appliance dealer here, has purchased the financial interest held by Eugene P. Wagner and has become president of the firm, as well as treasurer.

His wife, Mildred Palmer Bailey, who previously held the position of vice president, has assumed in addition the duties of assistant treasurer and clerk. Mr. and Mrs. Bailey and M. P. Brown are members of the company's board of directors.

Neither the company's name or its policies will be changed, the new president has stated.

The firm plans to alter its present quarters by installing two modern electric kitchens, enlarging the reconditioned merchandise department, and adding a new display room for small appliances. General Electric appliances are handled.

Lincoln Sales Holds To 'Carload A Week' Pace

BALTIMORE—Lincoln Sales Corp., Crosley distributor for the Baltimore and Washington, D. C. area, reports sales of more than a carload of Shelvador refrigerators a week, on the average, for the past several weeks, and claims to have sold all the units even before they were received from the factory.

Three carloads were received in the first half of March, and two more are on order for the last half.

Mundy & Fresen Open New Store

CONCORD, N. H. — Tasker C. Mundy and Paul A. Fresen have opened a new electrical appliance shop at 14 School St. in this city. The new shop, the Concord Household Appliance Co., handles Hotpoint refrigerators, General Electric ranges, and General Electric and Hotpoint washers and ironers.

Bureau Program Meeting To Open Milwaukee Drive

MILWAUKEE—G. W. Allison, national field represenative of Kitchen Modernizing Bureau, will head the list of speakers at the meeting called by Wisconsin Electric Power Co. for March 23 in the auditorium of the Public Service Bldg.

The power company will use this meeting as a springboard from which to plunge into its April refrigerator campaign. All appliance dealers in the area are invited to attend.

Southern Wholesalers Appoints. W H. Buck

BALTIMORE—W. H. Buck has been appointed to the sales staff of the Baltimore branch of Southern Wholesalers, Inc. to contact the trade in this city. Formerly he was connected with the Columbia Phonograph Co. at Philadelphia, and for the past three years was associated with the Crosley distributor in Maine.

SPECIFICATIONS for Air Conditioning and Refrigerating Installations

ONE of the most exacting duties of an architect or engineer is to draw concise and inevasible specifications for the guidance of contractors and the protection of his client. Such specifications should be founded on the specifications and regulations of nationally known and accepted authoritative bodies interested solely in public welfare.

The National Board of Fire Underwriters, Underwriters' Laboratories, Inc., and the National Fire Protection Association are institutions of this class. Each has contributed to the fundamental specifications covering air conditioning and refrigerating machinery. Every architect and engineer should have a copy of their rules and specifications:

(1) NBFU Pamphlet No. 90 entitled, "Regulations of the National Board of Fire Underwriters for the Installation of Air Conditioning, Warm Air Heating, Air Cooling, and Ventilating Systems as Recommended by the National Fire Protection Association." (This is also the A. S. A. standard Z33.2). Address National Board of Fire Underwriters at 85 John Street, New York City, or 222 West Adams Street, Chicago, Illinois, or Merchants Exchange Building, San Francisco, California.

(2) Underwriters' Laboratories, Inc., Subject 207, "Standard for Air Conditioning and Commercial Refrigerating Equipment." Address 207 East Ohio Street, Chicago, Illinois.

(3) Underwriters' Laboratories, Inc., Subject 207, "Standard for Unit Refrigerating Systems." Address 207 East Ohio Street, Chicago, Illinois.

(4) Underwriters' Laboratories Report MH2375 entitled, "The Comparative Life, Fire, and Explosion Hazards of Common Refrigerants." Supplies of this publication are exhausted at the Underwriters' Laboratories, but may be consulted in most public libraries in the United States. Reprints have been made by Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington, Delaware, and are available at $1.00 each.

It is often hard to compare values and capacity of the equipment offered and so it is well to provide that the contractor shall express his rating according to the following methods:

(1) "Standard Method of Rating and Testing Mechanical Condensing Units"—Price 15¢.

(2) "Standard Method of Rating and Testing Air Conditioning Equipment"—Price 20¢.

These standards are obtainable from the American Society of Refrigerating Engineers, 37 West 39th Street, New York City.

An example of concise yet comprehensive specification formulation that everyone should have may be obtained for 5¢ from the Superintendent of Documents, Government Printing Office, Washington, D. C. It is "Federal Specification for Air-Conditioning Units (Room-Coolers); Electric-Motor-Driven, Portable," 00-A-361 of July 23, 1938.

By following these rules you avoid any possibility of penalty to your client in insurance rates and promote safety of life and property. The "Freon"* refrigerants meet the requirements of these specifications.

KINETIC

FREON

REG. U. S. PAT. OFF.

safe refrigerants

"Freon" is Kinetic's registered trade mark for its fluorine refrigerants.

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

Air Conditioning

Distributor Thinks He Has Solution To 'Mystery of the Missing Profits'

By Henry Knowlton

KANSAS CITY, Mo. — Carter-Waters Corp. entered the air-conditioning business in a "big way" early in 1936 when the firm signed a franchise to distribute Delco-Frigidaire heating and air-conditioning products in the Kansas City area.

After many years of success in the building supply business, the company was financially able to "go along" with any factory program when an air-conditioning department was set up, with a complete personnel suggested by the manufacturer. This department was given space in the building occupied by Carter-Waters Corp. and has never been charged with rent, telephone, accounting, or other incidental expenses that go with the operation of any business.

According to Mr. Waters, the original personnel required an expenditure of $1,700 per month, amounting to $20,000 per year. This included an air-conditioning department manager, manager's secretary, one wholesale man, several city salesmen, one engineer with two assistants, one service manager with two assistants, and an installation superintendent.

At the present time the department is operating with a manager, one engineer, a service man, and two salesmen.

In the beginning mark-ups were established at 30% on the projected sales volume, but this has worked out, on the average, to be approximately 18%, Mr. Waters asserts. This, he believes, has proved to be about equal to normal business overhead.

After "paring down" his organization during the past year, Mr. Waters decided to make a careful analysis of his air-conditioning department with the idea of starting 1939 on a sound business footing, in an attempt to make a profit out of the department this year.

The text of Mr. Water's "Memorandum" to his air-conditioning department follows in full.

Feb. 4, 1939

"Although the sales in the air-conditioning department during 1938 were very substantial, the amount of gross profits was not sufficient to pay actual cash expenditure for salaries and traveling expenses of the men in the department to say nothing of paying a fair share of the overhead such as accounting, telephones, taxes, insurance, management, etc. If we had realized the amount of gross profit originally estimated on the various jobs when they were sold, we would have shown a fair profit for the department.

"This indicates either that the original estimates were too low, or that the estimates were correct but the purchasing of the materials and the installation of the jobs were badly managed. A study of the year's business indicates in some cases the estimates were too low, in many other cases the jobs were badly managed. The following is a statemen of some of the items which must be corrected this year.

"Item No. 1—In many cases after our engineering department had prepared a reasonable estimate based on a good conservative design, the salesman would present the quotation to the prospective buyer and bring back the report that the price was too high and that in order to meet competition, it was necessary to make a reduction in the price.

"The salesman, either independently or working with the engineer, would proceed to reduce the estimate by cutting out important items of equipment or labor. After the sale was made, both the salesman and the engineering department would become fearful of the efficiency of the revised design and during the course of installation, would proceed to restore practically all the items originally eliminated from the estimate without charging the customer for the additions.

"Remedy—In order to correct this condition in the future, the entire responsibility for the preparing of estimates has been placed with our chief engineer and his estimates will be final and the salesman may not make changes or reductions from this estimate unless the same is revised by the engineer. He, of course, is free to consult with anyone else in the department for suggestions or assistance but the final responsibility will be on him.

"Item No. 2—It appears that our superintendent has been obliged to carry on the installation of the jobs which we sell without having sufficient information regarding the work we are supposed to do. He tells me that he never at any time had a copy of our contract with the owner, nor did he have a layout or diagram showing the details of the various kinds of work such as wiring, piping, ductwork, etc. This, of course, meant that he had to continually consult with someone in the office who could give him directions from time to time as to how to install the work.

"Remedy—Our superintendent must be provided with a copy of the contract in each case and with complete diagrams and layouts to be prepared by our engineering department.

TOO MANY ORDERS

"Item No. 3—The installation superintendent was seriously handicapped by reason of the fact that his workmen were frequently subjected to orders given by others than himself. In some cases our superintendent would start several men to work on the job and would return later the same day only to find that someone or possibly all of them, had been ordered to go to other jobs by someone in the office. In some cases these men were called to service emergency jobs, in many cases were simply sent to carry on installation work on other jobs without the superintendent's knowledge.

"Remedy—In the future all labor having to do either with installation or servicing the jobs, will be directed entirely by the superintendent and no one else will have authority to direct the workmen either on installation or service except the superintendent. We realize in this connection we have a problem in handling service calls in hot weather which we must solve so as not to conflict with installations, and we are working on this now.

"Item No. 4—After the sale of the job and during the installation of same, we have been required to install certain equipment or perform certain work not included in our contract, because it developed that the salesman had verbally agreed with the owner either before the sale or immediately afterwards, that we would do things not included in the contract. Naturally these things add to the confusion of installing the job as well as add to the cost of same, and in many cases create ill will in the customer's mind.

"Remedy—In the future, all our proposal contracts must contain the following clause: 'No conditions, promises, warranties, or representations altering, detracting from, or adding to the terms of this contract, shall be valid unless written hereon and signed or initialed by the parties hereto or evidenced in writing from our office and accepted by you.' This provision must be rigidly enforced.

SHIFTED FROM JOBS

"Item No. 5—A great deal of dissatisfaction arose from the fact that our workmen were constantly moved from one job to another instead of concentrating on one job until finished and then beginning the next one. In some cases this was due to the fact that material was not on hand to finish some part of the job, but in many other cases, it was due to the fact that our salesman in order to make a sale or please the customer, took it upon himself to make unwarranted promises of an early start and an early completion of the job. Many of these promises were impossible of performance which only resulted in building ill will instead of goodwill; futhermore, it cost the company a lot of money.

"In one or two cases in order to try to make good some foolish promises made by salesmen, we had to employ men for overtime work at double the regular hourly rate, whereas the regular rate of pay was figured in the estimate. In the future, we will not put in any jobs on overtime rates, unless overtime rates were figured in the estimate and this point should be covered in the proposal and contract.

"Remedy—In the future the schedule of the installation of jobs will be in the hands of the department head and it will be his policy to take each job in its turn as it is sold. Therefore, do not make promises to your customers until you have consulted with him.

"Failure to do so will only result in embarrassment to yourself and to the company because we expect to install jobs strictly in the order in which they are sold except in an emergency in which case the decision will be up to the department head. Trouble can be avoided by being honest and frank with the customer at the time the sale is made.

"Item No. 6—During the past year equipment, materials, and supplies

(Concluded on Page 11, Column 1)

He Wanted Profits

ALBERT R. WATERS

A Distributor's Version of 'What's Wrong'

At the end of 1938, Albert R. Waters of Carter-Waters Corp., Delco-Frigidaire heating and air-conditioning distributor of Kansas City, made a careful analysis of his air-conditioning department, which has been operated at a loss for three years.

Mr. Waters intends to stay in the air-conditioning business, for he believes it can be made to pay. His analysis about what is wrong with his air-conditioning department and his suggested remedies should be read by everyone engaged in air conditioning today.

The report, which is published over Mr. Waters name, reflects the conservative, sound business thinking that has made Carter-Waters a successful company for many years.

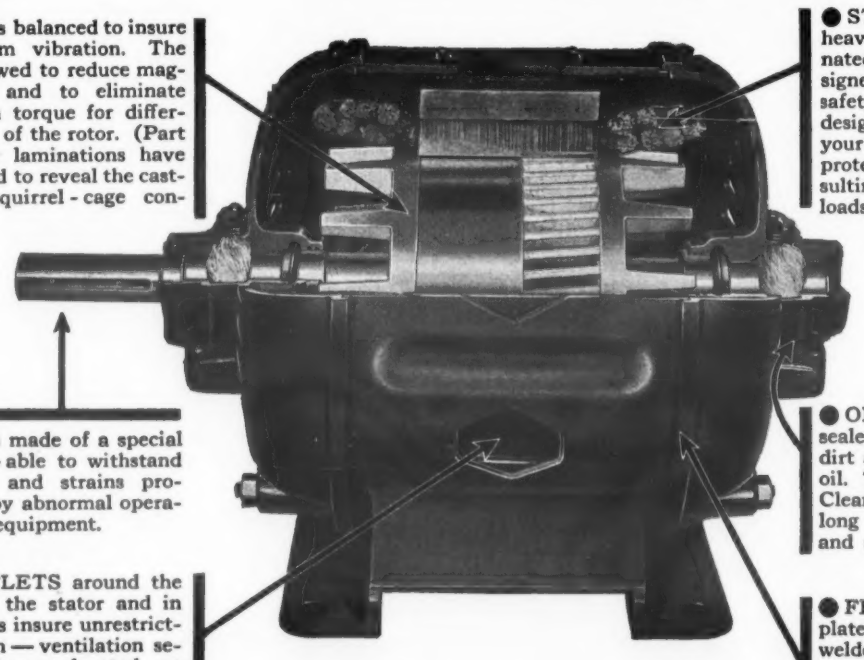
Wagner motors protect your name

MOTORS for air conditioning should have the necessary features to enable them to satisfactorily meet the requirements for that type of service. Customers and users can reasonably expect such features when they buy and install motor-driven air conditioning apparatus. You know and they know that a failure of the motor usually means a failure of the air conditioning equipment.

Wagner motors are skillfully constructed, intelligently engineered and carefully manufactured with all the essential features and characteristics necessary to insure long, satisfactory, continuous, trouble-free operation for those particular applications for which they are designed. It is for these reasons that manufacturers, contractors and users are choosing Wagner motors for their jobs. They have proved themselves to be efficient and dependable air conditioning servants.

● ROTOR is balanced to insure freedom from vibration. The slots are skewed to reduce magnetic noise and to eliminate variations in torque for different positions of the rotor. (Part of the rotor laminations have been removed to reveal the cast-aluminum squirrel-cage construction.)

● STATOR WINDINGS are heavily insulated, fully impregnated, securely braced and designed with an extra factor of safety. Well-insulated and well-designed stator windings are your guarantee of long life and protection against failures resulting from temporary overloads.



● SHAFT is made of a special alloy steel — able to withstand the stresses and strains produced even by abnormal operation of the equipment.

● OIL WELL HOUSINGS are sealed against the entrance of dirt and grit, and the escape of oil. They are made extra large. Clean oil and bearings insure long life, dependable service and smooth operation.

● AIR OUTLETS around the periphery of the stator and in the end-plates insure unrestricted ventilation — ventilation secured by blowers located on both ends of the rotor. A cool motor means better performance for both motor and equipment.

● FRAME is of heavy steel-plate rolled into shape and welded. It is strong and rugged to withstand the vibrations and strains of long, continuous service on air conditioning and refrigerating equipment.

Wagner type RP polyphase squirrel-cage induction motor with sections removed to reveal construction. A 3-hp, 1,750 rpm motor is shown.

Protect yourself - - - Use Wagner motors on your air conditioning equipment. Whether large or small motors are involved, there's a Wagner motor ideally suited for the job. The complete line of Wagner single-phase and polyphase motors is fully described in 52-page Bulletin 177 on fractional-horsepower single-phase and polyphase motors, 70-page Bulletin 182 on integral polyphase motors, and 18-page Bulletin 179 on integral single-phase motors—sent free upon request.

Wagner Electric Corporation

6400 Plymouth Avenue, Saint Louis, Mo., U.S.A.

MOTORS TRANSFORMERS FANS BRAKES

M39-5

The Humidity Stays UP!

Exhaustive tests show Rempe Unit Coolers to be especially well adapted for locker plants and other meat storage rooms, especially with regard to maintaining a high relative humidity. Recent tests show an 84 degree relative humidity at temperatures of 34 to 38 degrees and you know how important that is in preventing the loss of dried-out meats.

There are 336 different Rempe Unit Coolers for all refrigerants and for temperatures as low as ELEVEN DEGREES! Write for valuable, informative Bulletin No. 105.

REMPE Unit Coolers

REMPE CO., 340 N. SACRAMENTO BLVD., CHICAGO

Also stocked by Leo S. Bosarge Co., 315 Spring St., N.W., Atlanta, Ga.

Cost Analysis Reveals Several Sources of 'Extra' Expense

(Concluded from Page 10, Column 5)

for our jobs were purchased from time to time by no less than five individuals in the organization. The result was that the superintendent never knew what had been ordered and what had not, and in some cases equipment was ordered and shipped twice for the same job.

"Frequently also the job was held up because of the failure to get the equipment in time, each of the several parties involved in the buying believing that such items had been ordered by the other party.

"**Remedy**—In the future after the job has been sold and the layout and designs prepared by the engineering department, the department head will have complete charge of the purchasing of all materials and equipment, and the letting of subcontracts. The only exception will be that the superintendent is authorized to purchase small items which cannot be readily shown on the diagram or foreseen except during the progress of the job. It is understood the superintendent's authority is limited strictly to small items needed in an emergency.

TIME LOST

"**Item No. 7**—A great deal of time was lost during the rush season last summer in an effort to obtain many small pieces of equipment as they became necessary on the job. In some cases we paid a man at the rate of $1.375 per hour to pick up small fittings and take them to the job where two or three other high-priced men would be wating to use them.

"**Remedy**—We are increasing our stock of standard fittings and parts so they may be available at all times in our own warehouse. A report will be made to the department head from time to time on the conditions of our inventory and will suggest items that need to be ordered. All of you can help by suggesting to the department head certain items which you think we should have in stock.

"**Item No. 8**—A great deal of delay and confusion resulted last year because material from our storeroom stock was needed at times the storeroom would be closed. This was caused principally by the fact that the stock man had several other duties which took him away from the storeroom at times.

"**Remedy**—Arrangements are being made so that the first responsibility of the stock man will be the running of the storeroom. He will be on hand at all reasonable hours to issue materials.

'UNREASONABLE' HOURS

"**Item No. 9**—The service department was put to a great deal of trouble last year by being called upon to perform service work at unreasonable hours when the same was entirely unnecessary. In several instances, service men would be sent to a job late at night with instructions that the work was urgent and must be performed instantly only to find that the owner would be gone to bed or to the picture show and that the next day would have been just as good or even better. We have a lot of Frigidaire equipment in Kansas City and the responsibility for the service of the same is upon us. We intend and expect to meet this obligation fully but we want to avoid being stampeded by unreasonable demands for service. In practically all cases, night services, in my opinion, are unnecessary and we should confine our work to daytime as far as possible.

"**Remedy**—We are trying to solve the service problem constructively and until such time as we have it better organized, the only thing we can do it try to persuade the customer to be reasonable.

"**Item No. 10**—Some of our warehouse stock is in bad condition because of missing parts taken from this equipment during the rush season in order to install or service jobs. The result is that we now have a number of pieces of otherwise good equipment needing certain parts.

"This is a bad practice both from the standpoint of keeping our accounting and inventory records straight and worse yet, because it keeps our money tied up in a lot of equipment which is not usable because of missing parts. Furthermore, it takes the time of an expensive man to remove these parts and restore them (if they ever are restored). Robbing parts from built up equipment should only be done in an extreme emergency.

"**Remedy**—The man who is in charge of the storeroom stock is instructed not to permit the removal of such parts except on instructions from the department head or myself.

"**Item No. 11**—From time to time our accounting department was called upon to pay a pro rata share of advertising of various kinds, which had already been run by some of our out-of-town dealers, such advertising usually being in the local papers. We have a very fair and comprehensive plan of participating with the dealers in advertising but since we have to obtain approval of the Delco-Frigidaire Co. on the copy to get their participation, we in turn must insist that the dealer submit his copy to us for approval; otherwise we cannot guarantee to participate with him in the expense.

"**Remedy**—The credit manager has been instructed not to honor claims of dealers against us for participation in advertising unless our approval has been obtained prior to doing the advertising.

"**Item No. 12**—During the installation of our contract jobs, we frequently order equipment and material intended for the job, shipped direct to our own warehouse so that it may be safely stored until such time as the progress of the work requires its use on the job as we have found it is not usually safe to send expensive equipment to the job until they are ready to use it.

"In such cases it has been customary for the warehouse and accounting department to charge this material against the job when it is put in the warehouse and to carry it on our stock records as merchandise inventory. It happened in several cases that when the material was required on the job it was again billed against the job at the time delivery was made to the building, with the result the job was charged twice for the same material. This system also requires considerable clerical work in checking the material in and out.

"**Remedy**—In the future we expect to have such incoming packages properly tagged and identified on the outside of the package so that when they are received at our warehouse, they will be stored by the stock man and held in storage until delivery is required at the building but it will not be entered in the merchandise stock records. It will be charged to the job immediately upon receipt of the invoice from the manufacturer.

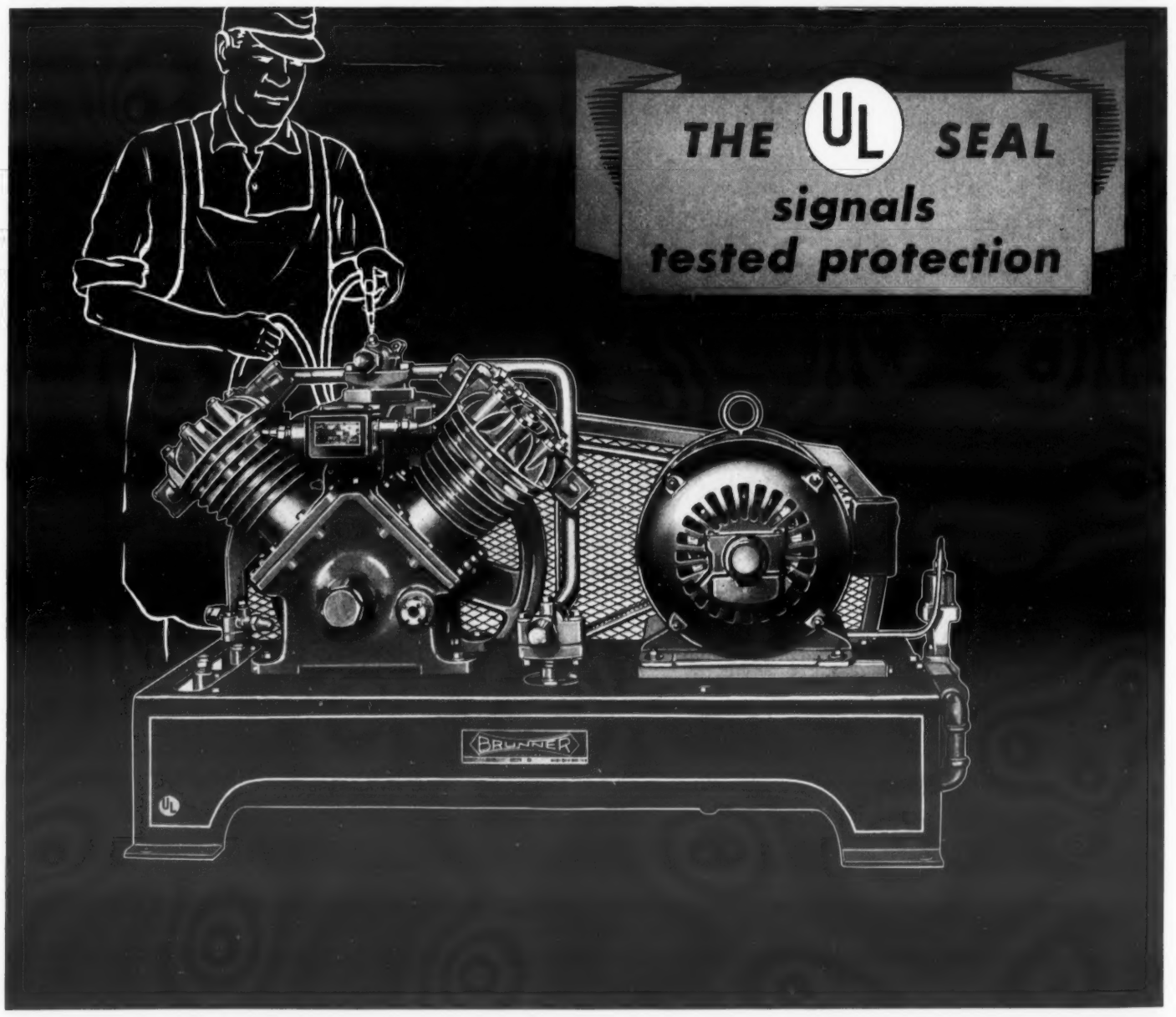
"You will note that in attempting to improve the handling of work in this department, we have had foremost in our thoughts the necessity of placing responsibility for the several parts of the work directly and exclusively upon some one particular person in each case. That alone, however, will not solve the problem unless there is complete, frank, and friendly cooperation between everyone in the department so as to eliminate dividing responsibility, buck passing, and the confusion that goes with it.

"Please accept your own responsibility fairly and fully consulting with each other or with me, whenever the interests of the company are at stake. Do the very best you can and the results will take care of themselves."

ALBERT R. WATERS

Smaller and Less Expensive

Lurelle Guild, industrial designer, traces features of the 1939 Carrier "midget" room conditioner to Barbara Evans, famed photographer's model. This legless unit will sell for $237.50 to $250.



Every Brunner Unit is tested for Underwriters' Laboratories Approval and Carries the U. L. Seal

Just as no Brunner Condensing Unit ever leaves the factory until it passes trial-run tests for performance, so no Brunner unit is ready for shipment until it passes the rigid Underwriters' Laboratories test for safe-proof construction throughout. Subjected to vacuum and to gas pressure tests far in excess of normal conditions, every connection, every detail is tested by an expert. It is on his okay that the UL seal is applied. Besides assuring more dependable and more economical service, the UL test protects the buyer of Brunner equipment against increased insurance rates; protects him, too, under the re-examination service . . . It is pre-shipment precautions like this that contribute much to the Brunner reputation for year-in, year-out dependability . . . Better get acquainted with Brunner today! Refrigerating and air conditioning equipment up to 15 tons of refrigeration. Catalog promptly on request. Brunner Manufacturing Company, Utica, N. Y., U. S. A.

The Symbol of BRUNNER Dependability

AIR CONDITIONING & REFRIGERATION NEWS

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Once a Sucker —Always?

WILL ROGERS once observed that "the United States has never lost a war—nor won a conference." And he might have added "nor collected a loan."

In discussing the article, "What They Say About War Down in Washington" which appeared in the NEWS a few weeks ago, several readers have made the statement that they believed a war might be good for business. War orders, they point out, might put our unemployed back to work, and raise the prices of foodstuffs to the point where agricultural subsidies might no longer be necessary.

Could be. But the only way the nations of Europe could purchase vast quantities of foodstuffs and munitions would be for us to lend them the money. They still owe us for the last war. And there isn't a ghost of a chance they could pay us for the next. We would just be giving our goods away—as we have been doing for two decades and longer.

For 20 Years America Has Given Away Its Exports

We're still struggling to climb out of a depression caused by the last war. The depression which would follow our giving away more billions of dollars worth of goods to bankrupt Europe in another war might put the skids under our economic system for sure.

Henry Grady, United States Tariff Commissioner (who has helped frame and negotiate the Hull Reciprocal Trade Agreements) told the editor last month that the total value of American exports during the last 25 years just about equals the total unpaid foreign debts and confiscated foreign investments. In other words, we've been giving our stuff away for the last quarter century. Look at the painful record:

1. The defaulted war debts.

2. The defaulted private debts.

3. American-owned and developed mines, lands, oil wells, and factories which have been confiscated by foreign countries.

'One-Third of a Nation' Have Pauperized Themselves

4. Huge sums which have been sent "back home" by immigrants. Incidentally, a great deal of the crying over the "one third of the nation ill housed, ill clad, and ill fed" might have been spared had this flow of money abroad been stopped years ago. It is the "one third" which sends the money back—and such money represents the margin between the way they lived in Europe, and their incomes here. Had they spent that money here, they could have lived far better, our own economy would have been in better shape, and at least by this time they wouldn't have been "ill housed." No other nation in the world would have tolerated such a drain on its capital.

5. The millions of dollars which are collected annually from American Catholics and sent to Rome; the millions of dollars which are collected annually from American Jews and sent to Palestine; the millions of dollars which are collected annually from American Protestants and sent to missions in China, India, and Africa.

6. The millions of dollars which are raised here and sent abroad every time there is an earthquake or some such disaster.

Charity Begins At Home —Especially Today

(It is, of course, touchy business to comment upon these last two items. We are a generous and "humane" race. But charity begins at home. Instead of rehabilitating Japan, China, and Spain, isn't our first duty to the dispossessed thousands from the Dust Bowl area? We send our cash abroad, but must borrow money to take care of our own unfortunates.)

George Peek, who was economic adviser to the AAA until he quit because his chiefs refused to recognize the implications of his statistics and fact-finding, prepared the following table summarizing all the financial transactions of Americans with foreigners for the 20 years from 1914 through 1933:

* * *

	Billions
Americans sold goods to the outside world valued at about....	90
They bought goods from the outside world valued at about....	62
Leaving the world in their debt	28
The world owed them for interest, freight, and other charges....	11
Gross total owed to Americans in 20 years	39
Against which the outside world paid Americans in gold....	2
And charged Americans for entertainment of tourists, for remittances sent abroad by immigrants, etc.	13
Total offsets to bill	15
Leaving the world in debt to Americans for 20 years business...	24
This debt was represented by:	
War debts due from foreign governments to the government of the United States	10
Increase in loans and investments abroad by American citizens and corporations	14
Total as above	24

* * *

Same Old Story Coming To Pass Again

But, you say, that's all in the past. We don't lend money abroad any more. True, the Johnson Act prevents loans to nations which have defaulted on their war debt payments. (Currently pressure is being brought to bear to repeal that highly sensible law.) And private investors aren't so easily skinned any more. But we have recently granted a $25,000,000 credit to China (what's *your* guess about chances of its ever being repaid?) and are setting up another big credit to Brazil.

That, however, is small time. We have figured out a new way to give our products away. We now buy gold and silver, and pay prices about 50% above the normal market for them. South Africa, Russia, and Australia are getting rich selling us gold at these artificial prices; Mexico's communistic regime is being kept alive by our silver purchases.

Does Our Gold Policy Make Sense?

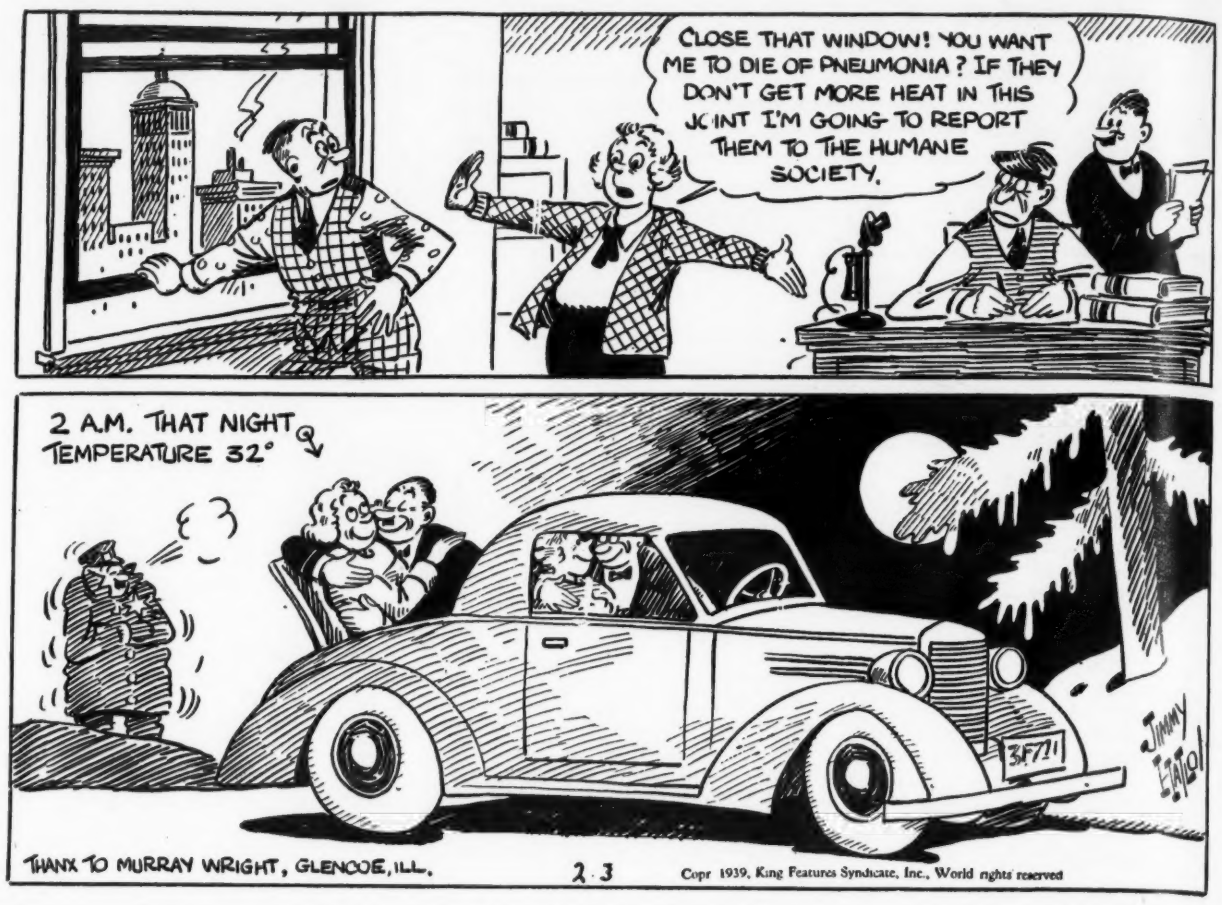
Russia is trading us gold (for which they have no monetary use) for machinery. In time their factories will be competing with ours in the already-glutted world markets. We equipped Japan's factories (getting silk for ladies' stockings in return) much to our present sorrow. Now we're doing the same thing for Russia. We send them instruments of production, which they want and don't have. They send us gold—which we don't want, don't need, and have too much of already.

What do we do with this gold? We bury it in Kentucky. Right now we have almost three fourths of the world's supply. At our present rate of acquisition, we'll have it all in two or three years. What happens then? Very handily the rest of the world can decide that gold doesn't matter any more; the German barter system can—and does—replace it in international trade. And we'll have enough gold to supply dentists and jewelers till kingdom come.

And now that we're about to exhaust the possibilities of gold-buying as a means of giving away the products of our fields and factories, another war seems to be coming along. If we get in it, the Johnson Act, of course, will go by the boards—we'll be forced to lend again to our Allies.

Uncle Sam has been the International Sucker long enough. It's time we paid attention to our own business, and kept our money, our goods, and our soldiers at home. We're the luckiest nation in the world geographically; if only we can keep our heads, we can remain a great nation long after the rest of the world has gone to pot.

They'll Do It Every Time . . . By Jimmy Hatlo


CLOSE THAT WINDOW! YOU WANT ME TO DIE OF PNEUMONIA? IF THEY DON'T GET MORE HEAT IN THIS JOINT I'M GOING TO REPORT THEM TO THE HUMANE SOCIETY.
2 A.M. THAT NIGHT TEMPERATURE 32°
3F71
JIMMY HATLO
THANX TO MURRAY WRIGHT, GLENCOE, ILL.
2-3
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LETTERS

How To Refrigerate 5,000 Cubic Feet?

Collier's Readers Research Bureau
250 Park Ave., New York, N. Y.

Editor:

May we ask your advice regarding the following inquiries of our correspondents? One inquirer writes:

"What is the best method of refrigerating 5,000 cubic feet? What is the best type of insulation for refrigeration from 32° to zero? What is the best type of insulation for refrigeration from zero to —10° F.?"

Another inquirer writes:

"I want to semi-air condition a basement. The basement is about 4,500 cubic feet. The summers are hot and very humid. As a result warm moist air enters the cellar, condenses on walls, floor, and metal contents causing the heater, tools, and other equipment to rust severely. There is no heat present except a well insulated gas water heater. Moisture does not enter from outside due to seepage or leakage.

"Last year there was a slight improvement due to keeping all windows closed. Would it help to open windows and use a circulating fan? The problem then, is, when to use the fan? Could calcium chloride be used economically with or without a fan? There are four windows, the north and south two being below ground level.

"I do not care about temperature or humidity as long as I can avoid a dewpoint condition. I do not want to go to the expense of actually heating the cellar with gas but if this is the last resort, how could it automatically be controlled to go on, when necessary? Would not an open gas flame only create more moisture?"

DORIS HASSELL, Director,
Readers Research Bureau

Answer: It does not appear advisable to attempt any recommendations in reply to your first inquiry since considerably more information regarding the conditions and the application is needed.

Regarding the second inquiry, it is possible that a chemical drying agent may be needed to take care of the excess moisture and we are referring the question to manufacturers. Again, however, more information regarding the conditions might suggest some other remedy.

In both of these instances it would appear that the inquirers need the services of a competent engineer or an experienced local dealer or contractor but possibly such service is not available in the localities in question. If the inquirers are mechanically minded and possibly with some experience in related fields, they may be able to get the information desired from available books on refrigeration and air conditioning, such as the "Air Conditioning Made Easy" series of books.

The author of this series of books on air conditioning is F. O. Jordan, whose address is 2150 Lawrence Ave., Chicago, Ill. He is available for consulting work and would be able to advise in detail regarding the solution of both problems through correspondence with the people interested. For this service he would require a fee which would be reasonable.

Colombian Engineer Wants Ready Reference

Apartado Numero 120
Cartagena, Colombia

Dear Sirs:

I have to acknowledge receipt of your letters of Feb. 3 and 14, the former dealing with my request for an Index to the NEWS for 1938, and the latter acknowledging receipt from my New York representatives of the balance due for one year's subscription to the NEWS for 1939.

I read in the NEWS before the receipt of your letter of Feb. 3 your observation on my request for the Index. Although I appreciate that indexing a newspaper entails tedious and careful work, you will doubtless realize that you cannot really compare the NEWS with ordinary newspapers.

The NEWS is a technical newspaper and contains continuously very interesting and instructive articles of much benefit to the refrigerating engineer, and I am of the opinion that if an Index could be supplied for the NEWS relating to all technical articles, subscribers would preserve more carefully every copy of the NEWS, as a reference for any question which may crop up in their work.

I feel firmly convinced that my views would be endorsed by all refrigerating engineers who are actively engaged in this very intricate and interesting line of occupation.

Please send me by return mail a copy of your Master Service Manual No. 3 on Commercial Refrigeration, and also a copy of Refrigeration Engineer's Manual, the value of which I will remit on receipt of your bill.

PETER VANDEYAR

Specifications

A. W. Frank, Hardware
412 Hancock St., Saginaw, Mich.

Sirs:

Kindly advise me by return mail if you are issuing 1939 Specifications of Comparative Data on the 254 Models of Household Electric Refrigerators offered by the 28 companies, the same as you did last year in your March 9 issue of AIR CONDITIONING & REFRIGERATION NEWS.

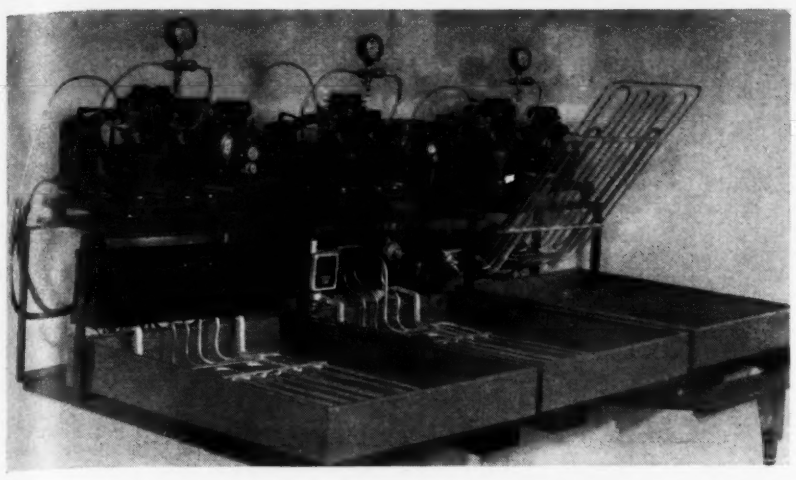
If so, I surely want one at the earliest date possible.

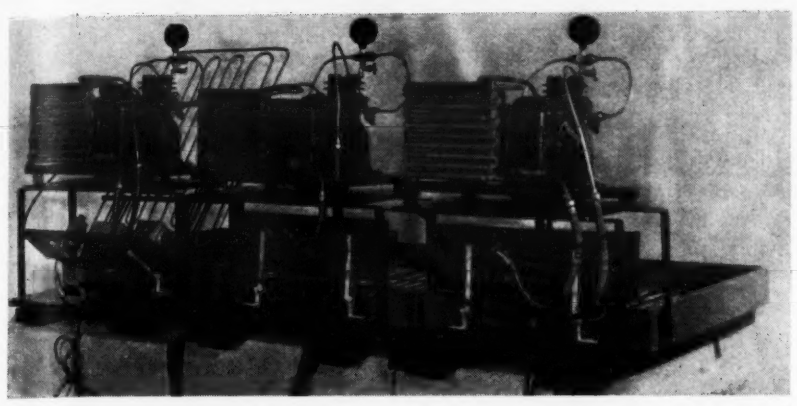
GEO. A. WYLIE

Answer: Specifications of 1939 refrigerators will be published as a supplement to the next (March 29) issue.

Commercial Refrigeration

Photographers Seek Help & Get It





Front and rear views of the unit for developing photographic film which was designed by the R. R. Robertson Co. of Chicago. This unit holds the solution at a temperature of 65° F., with a tolerance of only 1° F. Note how the assembly can be tilted. Imperial Brass Mfg. Co. charging and testing unit No. 500-C and Imperial charging lines are used in the unit.

• • •

Refrigeration Solves Problem of Close Control of Film Developer Temperature

By the Engineering Department, Imperial Brass Mfg. Co.

MECHANICAL refrigeration is now branching out into the photographic industry. In order to maintain a high degree of efficiency in developing modern film it becomes necessary to hold the developing solution at a temperature of 65° with a tolerance of 1° F.

Reason for this is that when the temperature of the solution reaches a higher point it speeds up the developing process causing over-developing, and when it drops to a lower point the process is slowed, affecting the quality of the picture and making it impossible to predetermine the exact time required for developing the picture.

The developing solution is of a formaldehyde base and is poured into a tray 24 x 26 inches (a popular size). This tray is then immersed into a sweet water bath, and here a combination of cracked ice and warm water is used to maintain the proper temperature.

It is obvious that this method requires constant vigil with a thermometer in the bath, and the operator is in no way assured of constant temperature because the problem of heat transfer where 1° differential is expected is a very difficult one.

The problem of heating and cooling mechanically without the use of relays and separate controls has been overcome by the R. R. Robertson Co., 400 W. Madison St., Chicago, manufacturer of processing cameras and photographic equipment. This company builds a unit that is simple in design and very accurate in maintaining temperatures of 1° differential.

The unit consists of a ⅛-hp. condensing unit and a 200 watt heating element in the form of a 5/16-inch copper tube 10 feet long, together with 25 feet of 5/16-inch cooling coil so formed as to give a maximum uniformity of heat dissipation.

These coils are fastened to a hinged bracket which is part of the base upon which the outer tray is set; the control bulb is likewise fastened to the coils, properly insulated, making the entire system one movable assembly.

Expansion valve, electrical connection box, and temperature control are mounted on a panel, an integral part of the hinged bracket.

In operation the assembly is lowered into the outer tray containing a sweet water brine to a depth of about 1 inch and the developing tray (usually made of iron vitreous enameled) holding the developing solution is then placed in the water resting on the strips holding the coils as an assembly.

The control consists of a double-throw banana-shaped mercury bulb switch, the purpose of this shape being to permit a slight intermediate cycle. This bulb is actuated by a bellows and a single thermostatic control bulb.

As a safety factor another mercury bulb (a part of the control) is provided and mounted in such fashion that when the assembly is raised to remove the outer tray the bulb is tilted and the entire circuit is broken. The condensing unit is connected to the system by means of flexible tubing.

The heating unit functions only in the winter time.

Ice Cream Plant Will Install Oven To Dry Own Refrigerating Equipment; Adds Machinery

BALTIMORE — Bettar Ice Cream Co. here has inaugurated an expansion program which calls for the installation of an automatically operated popsicle tank, a 20-ton refrigerating plant for the tank, an electric oven dryer for the refrigerating equipment, facilities for the production of a new type stainless steel front ice cream cabinet, a modern laboratory, and two 7-ton refrigerated delivery trucks.

The popsicle tank will enable Bettar Ice Cream to produce as many as 720 dozens (8,640) popsicles an hour, as compared with a present capacity of only 50 dozen (600) an hour, declared Louis A. Carliner, head of the firm.

In the operation of the tank, ice cream flows from the freezer to the filter, and then to the tank until the popsicle is ready for packing and shipment.

To operate the tank, a 20-ton York refrigerating plant is being installed in a compartment separate from, but adjoining, that housing the tank.

With the oven dryer, it will be possible for the firm to dry all of its own refrigerating equipment used in refrigerating ice cream cabinets, thus making for greater economy and efficiency.

The ice cream cabinets planned for production will mostly be of the eight-hole, 40-gallon size, with large units also available. They will be sold or leased to Bettar's own customers.

Bettar's new trucks are said to be among the largest of their type in this section of the country, each having a capacity of 1,200 gallons of ice cream. Refrigerated bodies are cooled by Kold-Hold plates. One truck has a 1½-hp. Brunner compressor, the other a 1½-hp. Copeland unit.

Meeting Planned on Selling Practices

BUFFALO—Over 130 leaders from business, consumer organizations, educational institutions, and government agencies in the United States and Canada have accepted the invitation of the National Association of Better Business Bureaus to become members of the advisory council for the business-consumer relations conference on advertising and selling practices to be held here June 5 and 6.

The advisory council is being consulted in the shaping of the conference program so as to insure adequate attention during the two-day session to the major problems of each of the four groups—business, consumer, education, and government—in regard to advertising and selling practices.

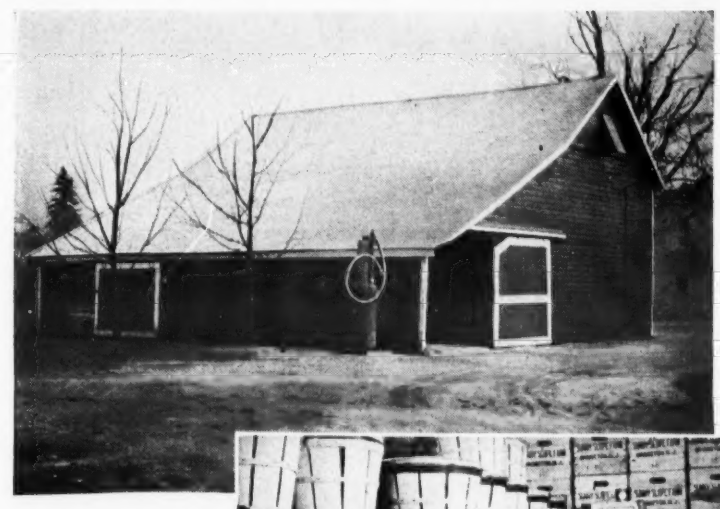
Members of the advisory council will include, it is said, individuals who have been active in the field of consumer education and in the improvement of advertising and selling practices.

Orient finds a fertile field in
REFRIGERATED FRUIT STORAGE
with
M&E COMPRESSORS

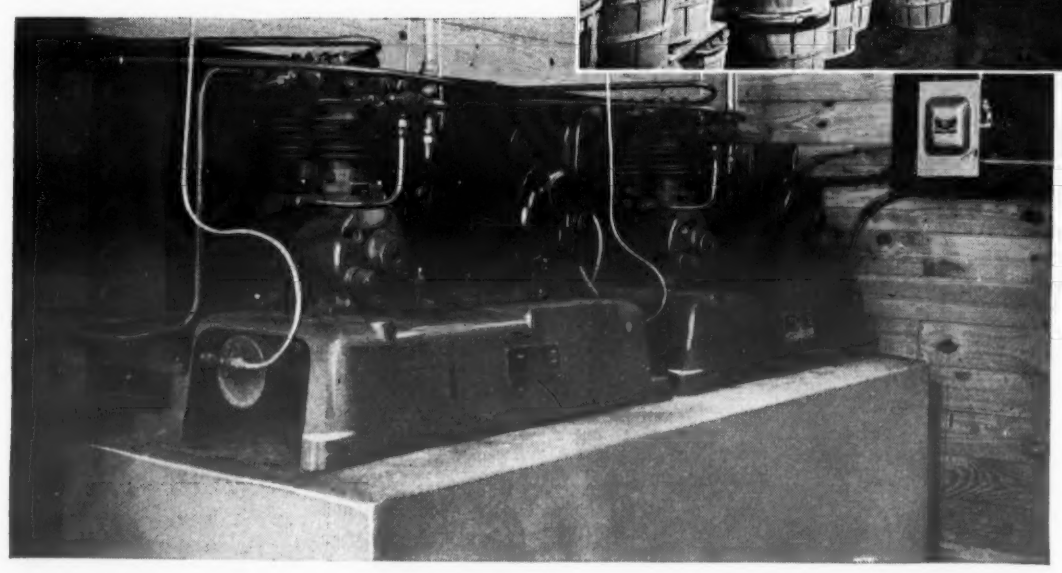
"Guarantee profits with your own storage" is the message of The ORIENT COMMERCIAL REFRIGERATION CO. of Jersey City to fruit growers.

Scores of these small, converted storage plants in the territory covered by ORIENT testify to the growth of the idea. Baldwins and Winesaps can be stored this way as long as 7 months at a temperature of 31 to 32° with a relative humidity of 85 to 88°. Sold out of season at premium prices they pay handsome profits to private plant owners.

ORIENT has found over a period of years that their best guarantee of trouble-free, economical service to the farmer is the exclusive use of M&E heavy duty equipment. Rugged M&E compressors are doing outstanding work in this new and interesting field, and The ORIENT Co., is but one of many successful organizations that have found M&E equipment a solid foundation for profitable expansion.



On the fruit orchards of Mr. Charles Fitting, Hammonton, N.J. Barn converted into cold storage room with 4" of insulation by ORIENT AIR CONDITIONING AND COMMERCIAL REFRIGERATION CO., Jersey City, N. J. using two 2 HP M&E COMPRESSORS.



M&E EST. 1866

The M&E line of compressors is complete from ¼ HP to 25 HP and includes compressors with jack shaft and gas engine for use where electricity is not available. The new M&E COMMERCIAL CREDIT PLAN is available everywhere for M&E Distributors and Dealers. Write for complete CATALOG.

MERCHANT & EVANS CO.
PHILADELPHIA, PENNA. • Plant: LANCASTER, PENNA.

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Square Feet of Area Only Needed In Use Of New Load Chart

HOLLYWOOD, Calif. — Reliable estimates of the heat load for standard commercial refrigeration installations requiring only measurements of the amount of insulated and glass area are made possible through the use of a chart which was developed and put to use by Hiland G. Kirkwood, district commercial engineer for the Frigidaire division, General Motors Corp.

Purpose of the chart (shown on page 16) is to find the load per hour from the square feet of exposed surface and the square feet of glass in a particular installation.

While the chart was made on the assumption that the insulation being used is corkboard, Mr. Kirkwood states that it is accurate enough for the average job when the insulation is Palco Wool, Rock Wool, etc. If more accuracy is desired when other than corkboard is the insulation used, a correction should be made by multiplying the total B.t.u. load by the percentage difference in the "K" factors of corkboard and the other insulation.

HOW TO USE CHART

To use the chart, relates Mr. Kirkwood, proceed as follows:

"Determine by measurement the area in square feet of the exposed surface of the refrigerator, less any glass area. Locate the line corresponding to this area in the upper right-hand margin, then follow this line over to the left until it intersects a diagonal line representing the temperature difference between the room temperature (dry bulb) and the desired dry-bulb temperature inside the refrigerator.

"Follow the line from this point of intersection down the chart until it intersects a diagonal line representing the number of inches of insulation used in the refrigerator. Then follow the horizontal line from this point of intersection to the left margin of the chart where the surface load will be found expressed in B.t.u. per hour for both 16 and 18 hours compressor running time.

"This is the surface or "heat leak" load only and must be multiplied by the service factor corresponding to the type of service on the refrigerator (light, normal, heavy). See Table 1, where the proper factor to be used will be determined by the installation man's estimate of the type of service, and the amount of insulation in the job.

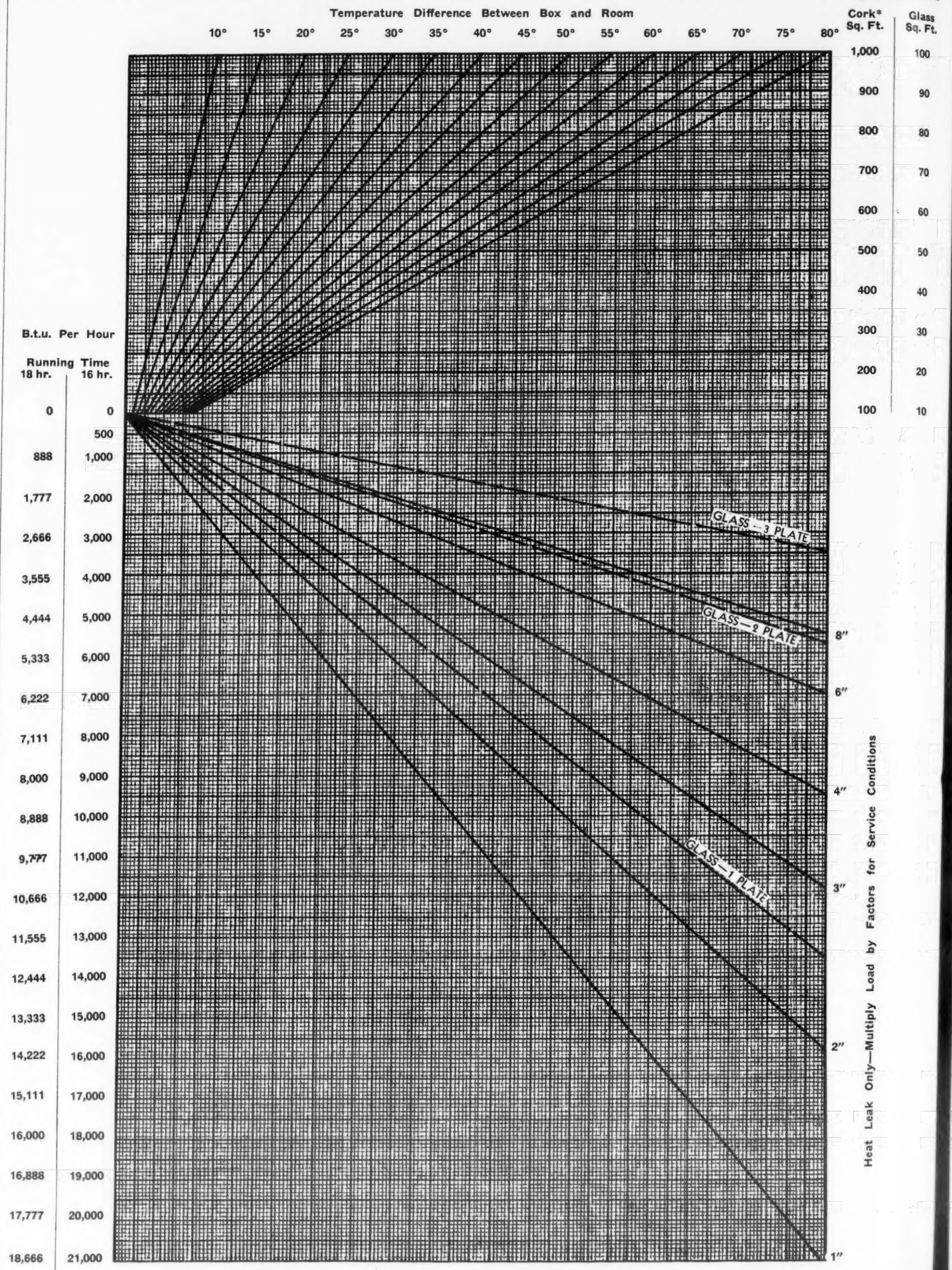
"The load for the glass area of the job will be found in the same manner as that of the other exposed area, except that the broken diagonal lines, representing the number of plates of glass, are employed instead of the solid diagonal lines. The result is also multiplied by a service factor, from Table 2.

"The two loads, one for the insulated area and the other for the glass area, are then added together to provide the total load for the proposed installation."

The column for 18-hour compressor running time is generally used for forced-convection coils, Mr. Kirkwood notes.

When the area is larger than provided for on the chart, multiply by 10 or 100, in which case multiply the B.t.u. figures in the column on the left by 10 or 100, as the case may be.

Chart To Provide Quick Estimates of the Heat Load In Commercial Refrigerators



*Cork or equivalent in square feet.

Table 1—Factors For Service Load For Insulated Area

Thickness of Insulation (Inches)	1	2	3	4	5	6
Factor by Which to Multiply (Light Service)	1.095	1.122	1.16	1.213	1.27	1.357
Factor by Which to Multiply (Normal Service)	1.183	1.243	1.318	1.41	1.56	1.7
Factor by Which to Multiply (Heavy Service)	1.24	1.332	1.433	1.554	1.743	1.95
Factor by Which to Multiply (Super Service)	1.3	1.412	1.543	1.682	1.92	2.172

Table 2—Factors For Service Load For Glass Area

Thicknesses of Glass (Number)	1	2	3
Factor by Which to Multiply (Light Service)	1.062	1.14	1.205
Factor by Which to Multiply (Normal Service)	1.255	1.279	1.432
Factor by Which to Multiply (Heavy Service)	1.22	1.39	1.55

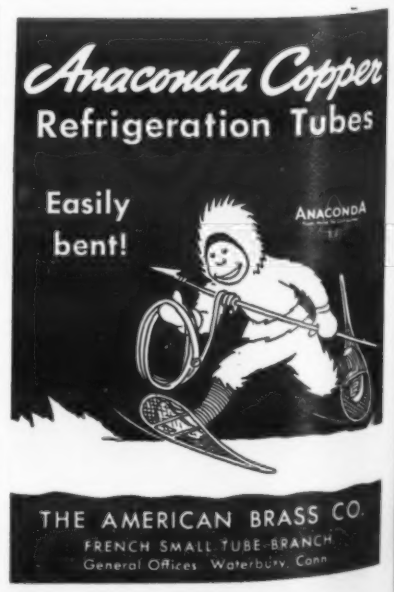
New Friez Controls Have 'Hydraulic Action'

BALTIMORE—A new line of refrigeration temperature and pressure controls featuring the "hydraulic action" principle has been announced by Julien P. Friez & Sons, division of Bendix Aviation Corp.

Available in types for use with display cases, ice cream and frozen food cabinets, milk, beer, and bottle coolers, walk-in refrigerators, and other commercial and industrial refrigeration applications, the new controls are actuated by solid liquid charges.

The charges, from which all gases have been excluded, actuate the switch contacts so powerfully that extremely high loads can be carried without relays, it is claimed by the manufacturer.

A Dehydrator that is really Dry. Mueller Brass Co. Dri-Drier.
MUELLER BRASS CO.
Port Huron, Mich.



Service Methods

Scale In Condenser Water Tubes Can Be Removed By Application of Acid

By R. S. Heym

Water used for condensing purposes in large commercial refrigerating systems in many sections of the country contains sufficient amounts of the salts of calcium and magnesium to result in the formation of scale deposits on the inside surfaces of the water tubes of the condenser.

Trouble with scale formation is most prevalent in localities where the water, in addition to being hard, has a relatively high temperature, resulting in high condensing temperatures.

MOST COMMON SCALE

Perhaps the most common scale found is calcium carbonate, which forms on the warm tube surfaces as the result of the breakdown of calcium bicarbonate. Effect of this scale, as of any other, is to lower the operating efficiency of the condenser by impeding heat transfer. As the scale builds up, it offers more and more restriction to water flow, and the higher condensing temperatures accelerate scale formation. So eventually the condenser must be either cleaned out or thrown out.

If the condenser is equipped with removable headers, it is common practice to turbine the tubes. When this method is used with copper tubing, however, care must be taken to keep the tool from chewing into the metal.

USE OF AN ACID

If the condenser is so constructed that the tubes cannot be cleaned in this manner, another method, embodying the use of an acid in conjunction with an organic inhibitor or a specially prepared acid-inhibitor solution known as Duclean No. 2 and manufactured by The Grasselli Chemical division of E. I. du Pont de Nemours & Co., Inc., may solve the problem. The acid dissolves the scale and oxides and the inhibitor prevents, or greatly retards, the attack of the acid on the metal.

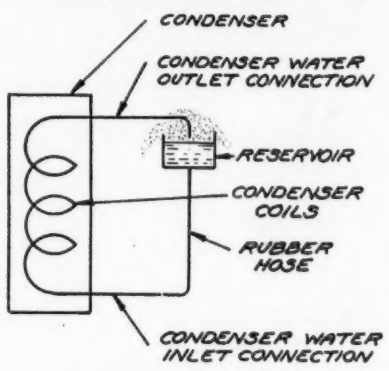
A 20% (by volume) solution of muriatic acid is used in this method of scale removal. To prepare this solution, add four gallons of water to every gallon of acid used. Then to each 10 gallons of this mixture add one liquid ounce of Grasselli No. 8 inhibitor. Mix the resulting solution thoroughly. If the Duclean solution is used, no inhibitor need be added.

ADDING ACID SOLUTION

Then, as shown in the diagram, add this acid solution to the bottom passes so that it may flow up through the tubes. Have the condenser outlet vented into the reservoir, as the attack of the acid on the scale results in the formation of carbon dioxide and there is liable to be quite a spray coming out of the vent.

After the acid has reacted for several hours (the time is lessened if the acid is hot) the gas evolution will stop. The acid should then be tested to determine whether or not it has been used up. This may be done by taking a sample of the solution and testing its acidity.

Condenser Cleaning Setup



Acid added at the bottom flows up to reservoir.

TEST ACIDITY

If the sample shows a weak acidity, the acid solution should be pumped out and a fresh charge put in. If it shows a strong acidity, it indicates that all the scale has been dissolved. The solution should then be dumped and the water tubes flushed thoroughly with clean water. The condenser should then be checked thoroughly for leaks before being installed in its place on the condensing unit.

The cleaning of a condenser in this manner is recommended only when competent supervision is available. It must be remembered that the inhibitor does not prevent electrolytic action between dissimilar metals which contact the solution.

It is advisable to remove the condenser from the unit before commencing the cleansing operation so as to avoid spilling acid on the motor, compressor, etc. Also, all refrigerant should be discharged from the condenser before the cleaning takes place.

Free Leak Detector Wicks Offered To Service Men

PHILADELPHIA—Detector wicks, used to discover the source of ammonia leaks, are being offered free to refrigeration men by the Pennsylvania Salt Mfg. Co., manufacturer of aqua and anhydrous ammonia refrigerants.

To find a leak, one of these sulphur wicks is lighted and all connections tested by holding the sulphur flame close to each of the suspected points. A white cloud is said to form at the point of a leak.

A card of six of the detector wicks can be obtained free by writing to department 19 of the company, located at 1000 Widener building, Philadelphia, according to the announcement.

Selection Made Easier By Brunner Catalog

UTICA, N. Y.—Page upon page of information on the technique of equipment selection is included in the latest refrigerating equipment catalog issued by Brunner Mfg. Co., in line with that company's belief that it is just as important to specify capacities correctly as it is to design and build units correctly.

So the new Brunner catalog not only furnishes buyers and prospects with a complete description of the Brunner line, but also simplifies the process of selecting the proper unit for each particular application.

As for the equipment itself, the 1939 Brunner line includes air and water cooled condensers for practically all refrigerating and air-conditioning applications from ¼ hp. to 15 hp. Many refinements of design and construction are said to be incorporated in these models.

Units formerly using a single-belt drive now are equipped with two belts. Overload protection has been added. Capacities, based on A.S.R.E. ratings, have been increased. Range of ratings is wider, from —20° to +25°. Condenser surfaces on many models have been increased to provide greater efficiency, lower costs, and quieter operation. The larger water-cooled units, employing shell and finned tube condensers, are said to present an unusually compact assembly.

All of the 1939 Brunner units bear the Underwriters' Laboratories Seal of approval, signifying that each piece of equipment has been rigidly inspected in accordance with the Underwriters' regulations before leaving the factory.

The new Brunner catalog, and any other desired information about the company's equipment, may be obtained by writing to Brunner Mfg. Co., Utica, N. Y.

Marsh Introducing New Recording Thermometer

CHICAGO — Small, inexpensive, embodying a specially constructed pen and pen arm, and bearing the name "Serviceman," a new addition to the line of recording thermometers manufactured by Jas. P. Marsh Corp. has been announced.

A bi-metallic spiral said to be of advanced design forms the "heart" of this new instrument. The pen arm has a friction hinge which permits it to be swung clear of the chart to facilitate chart replacement.

The chart itself is rotated by a fully adjustable clock movement wound by a knob which extends through the back of the case. A pointer on the dial enables the operator to set the chart at the proper time. Zero adjustment is made by means of a screw similar to that of the Marsh "Recalibrator."

Measuring only 6 x 5 x 2¼ inches and weighing less than 2 lbs., the thermometer is readily portable.

Case is smooth cast-aluminum finished in satin black with polished chrome bezel. A dust-tight hinged door forms the front of the instrument.

The thermometer comes packed in a durable hinged container which also contains a supply of charts and ink. A wide variety of charts (in either Fahrenheit or Centigrade scales) designed for various applications is available. A leather carrying case also may be obtained, the manufacturer states.

Los Angeles RSES & ASRE Hold Joint Meeting

LOS ANGELES—A joint dinner meeting of local chapters of Refrigeration Service Engineers' Society, American Society of Refrigerating Engineers, and National Association of Practical Refrigerating Engineers was sponsored March 13 at Sculley's Cafe by Los Angeles Chapter No. 1 of the R.S.E.S.

Following the dinner, T. C. McKee, Jr. of Detroit Lubricator Co. presented a sound film on expansion valves and refrigeration controls.

Mississippi RSES Holds Third Annual Banquet

DAVENPORT, Iowa — Mississippi Valley Chapter No. 1 of the Refrigeration Service Engineers Society held its third annual banquet in Hotel Blackhawk here recently with approximately 150 service men present.

The chapter's year book, containing advertisements of a number of firms connected with the refrigeration service field, program and menu of the meeting, and a list of the personnel of the National R.S.E.S., was distributed at the banquet.

Kelvinator Shows In Oregon

PORTLAND, Ore. — A series of dealer meetings to introduce the 1939 line of Kelvinator home appliances to the trade have been held here by Appliance Wholesalers of Oregon, distributor. The meetings were under the direction of J. G. Severtson, manager, and R. G. Masters, sales manager.

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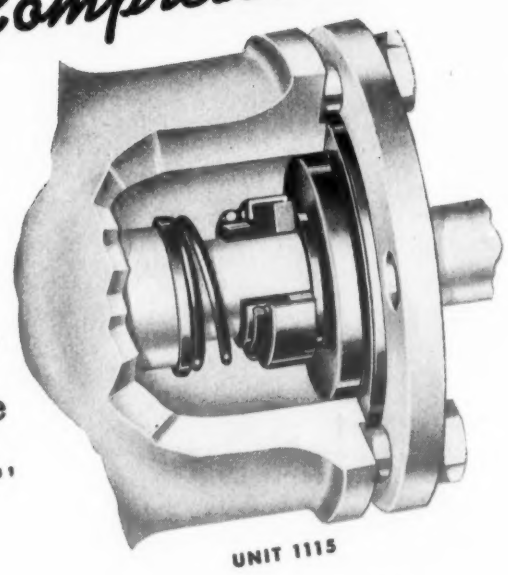

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Engineering

Cooling Unit In Two Sections & Fed By Two Refrigerants Is Used In New Norge Model

By the Engineering Department, Norge Division, Borg-Warner Corp.

In the C/M Synchronizer refrigerator that heads the Norge 1939 line have been introduced new principles which make possible refrigerator food compartment temperatures as much as 10° lower than the general practice, together with the proper degree of humidity.

The name is derived from the Colder/Moister conditions that are achieved by this development.

The cooling unit has an ice freezing or inner section maintained at a very low temperature; and an outer section at a higher temperature which cools the cabinet. The simplicity of this cooling unit is made possible by an entirely new development, comprising a dual mixed refrigerant system.

The earliest mechanical refrigerators, maintaining temperatures not many degrees colder than the old damp ice boxes, produce a comparatively "dry cold." Engineering progress has made possible much lower temperatures, but one difficulty has been that when these lower temperatures so desirable for better preservation of food were attained the food would sometimes dry out too rapidly.

By using a freezer with more cooling surface and at a temperature not so far below that of the cabinet, excessive dryness can be prevented. This is what Norge engineers claim to have accomplished in the new design.

On a cold winter day, house windows have a tendency to frost. The colder the weather and the more moisture in the air of the room, the more pronounced is this tendency. The frosting of the windows is caused by moisture in the air of the room being condensed on the cold windows. In a refrigerator, moisture from the food is condensed in the form of frost on the cooling unit, thus causing the food to become dried.

In the new mechanism a cooling unit with a very large surface area is used. The large area of heat-absorbing surface makes it possible to reduce the temperature difference between cooling unit and cabinet temperature. This provides proper combination of lower temperature and higher humidity, as the moisture in the cabinet is not so prone to condense.

The solution is simple up to this point, but it is also essential to provide quick freezing of ice cubes and frozen desserts, and the storage of ice cream and frozen foods. The higher temperature of the freezer helps the humidity, but if the ordinary cooling unit construction were used, it would slow up ice freezing to an impractical extent.

Norge solved this problem previously in the "Low Temp" model by the use of two separate refrigerant control valves, one feeding the inside freezing compartment and the other feeding the outer section cooling cabinet. This method gave good results which have been successfully retained in the new C/M Synchronizer.

The dual refrigerant system contains a mixture of sulphur dioxide and "Freon-12." Both are compressed and condensed together and are carried to the freezer in a liquid mixture of definite proportions.

How the Two Refrigerants Work In New Norge Model

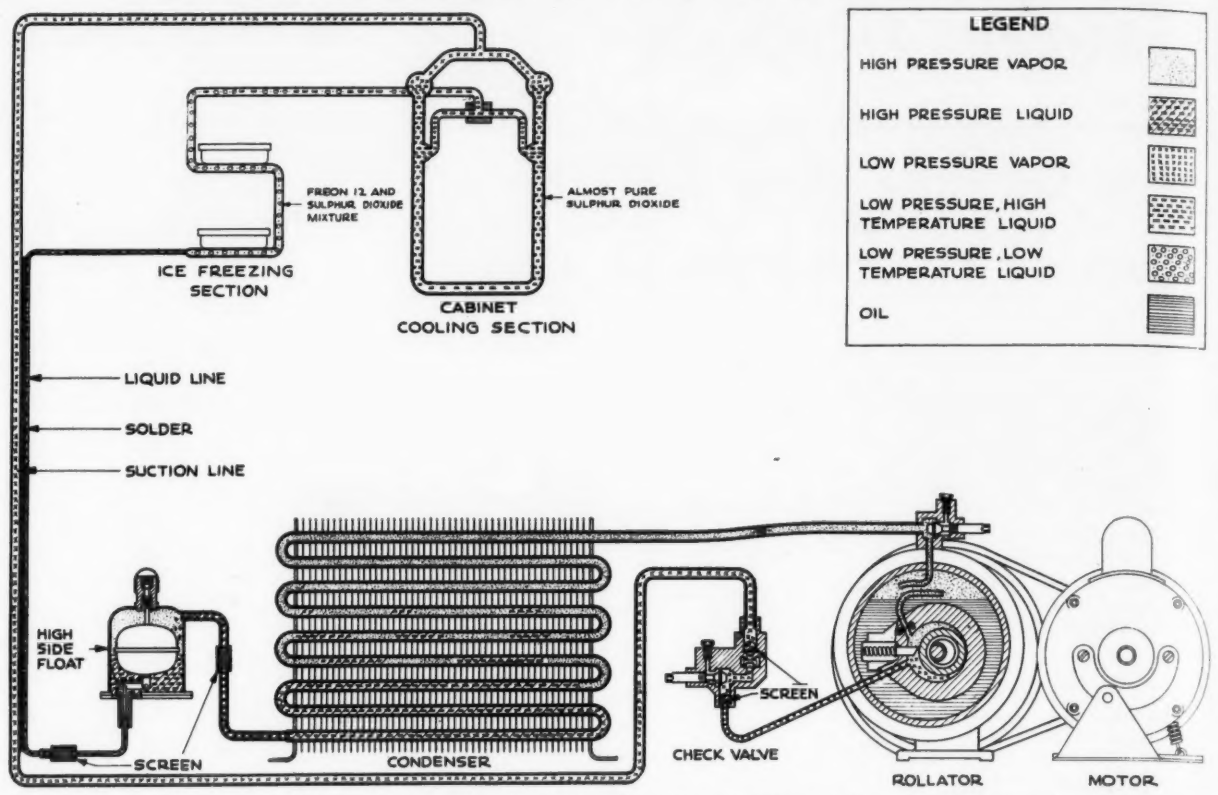

Diagram of the Norge C/M Synchronizer system showing the condition of the two refrigerants in the various stages of their course through the household refrigeration system.

The "Freon-12" boils out first in the freezer shelves at a very low temperature, and the SO_2 evaporates later at higher temperature in the outer cabinet-cooling section of the unit.

The action of the two refrigerants in the C/M Synchronizer cooling unit is somewhat similar to that of a mixture of alcohol and water in an automobile radiator. As is commonly known, the alcohol has a lower boiling temperature and will vaporize, or boil off, much more readily than water, so that the radiator may soon contain water only.

A similar effect is obtained in the freezer shelves of the new model. The "Freon-12," having a lower boiling temperature than the SO_2, vaporizes rapidly in the shelf coils and a very low temperature results. This means quick freezing of ice cubes and excellent storage qualities for foods that require extreme cold.

By the time the refrigerant leaves the shelf coil, practically all of the "Freon-12" has been vaporized. The liquid SO_2 that remains circulates through the cabinet-cooling, or outer section, of the unit. Thus the average outside freezer temperature will normally be considerably higher than the shelf temperature.

The C/M Synchronizer freezer is fitted with external fins which give a total surface available for cooling the cabinet 150% greater than that of an ordinary evaporator. Since every part of this large surface is absorbing heat, the temperature of the food storage compartment is kept low.

The new system is powered by the Norge "Rollator" compressor. The mixed refrigerant vapor from the top of the freezer is drawn into the rollator, compressed, and discharged into the condenser, from which it flows as a liquid mixture into the high side float valve housing. As the refrigerant liquid level rises in the float valve housing, the float ball lifts the needle off its seat and the liquid is metered through a screen into the liquid line. Oil in the system follows the same path as the refrigerant.

The liquid and suction lines are in direct contact, forming a heat interchanger. Heat is transferred in this way from the liquid line to the colder suction line, reducing the temperature of the liquid and increasing the overall efficiency.

The cost of operation compares favorably with that of any refrigerator of similar size and motor capacity.

Facts on Diesels Given In Dodge Booklet

DETROIT—Embarking on broad missionary work to acquaint the transportation world and the general public with the Diesel engine, Dodge division of Chrysler Corp. is offering an illustrated booklet, "Dodge and Diesel," to be mailed free to anyone requesting it by writing to the truck sales department of Dodge division, Chrysler Corp., Detroit.

The company's desire to bring greater Diesel consciousness to the public was motivated by the recent introduction of a Diesel-powered Dodge 3-ton truck.

The texts presented in "Dodge and Diesel" explain and drawings illustrate what the Diesel engine is and how it operates as compared with the conventional gasoline engine. Facts about the "Full Diesel," the "Semi-Diesel," and between four and two-cycle Diesels are set forth in the booklet.

Insulation For Concrete Construction Described

CHICAGO—Written especially for architects, contractors, and laymen interested in modern heat and sound insulation materials for concrete wall construction, a new 12-page folder has just been issued by Pottsco division of the Celotex Corp. here.

The folder describes the use of Pottsco light weight concrete units in building construction work, and gives illustrations, facts, and figures.

Part of the folder is devoted to a semi-technical explanation of heat and sound transmission, with suggestions as to preferred methods of dealing with each. Designed as a reference guide for those interested in concrete wall construction of all types, copies of the booklet are obtainable from the company.

Hollow Cone Type Of Nozzle Introduced

CHICAGO—A new line of spray nozzles, featuring the "whirljet angle type" which produces a hollow cone spray, has been introduced by Spraying Systems Co. here.

Nozzles are designed with ⅜-inch male pipe connection, and are available in six different capacities from 0.5 to 2.5 g.p.m. at 10 lbs pressure. Standard stock construction is brass, though other metals can be specified. Nozzles may be used in air conditioning, air washers, brine spraying, and similar uses.

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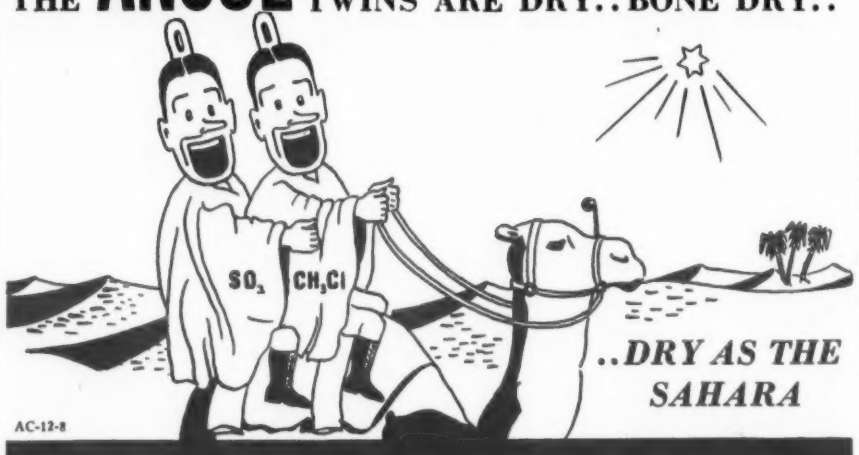

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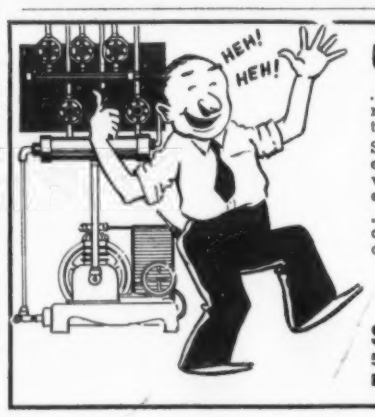

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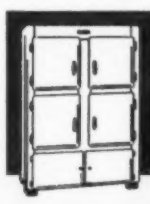

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Commercial Service

Analysis of Service Complaints on Fountains & Remedies (Cont.)

Common types of service complaints in mechanically refrigerated soda fountains and suggested service methods are given in this part of the series of articles by Arch Black and Dean C. Seitz on installation and servicing of soda fountains and low-temperature cabinets, which series of articles are appearing regularly in the weekly issues of AIR CONDITIONING & REFRIGERATION NEWS.

By Arch Black and Dean C. Seitz

(A) Complaint—Ice Cream Too Soft or No Refrigeration In Ice Cream Section (Cont.)

CAUSE—THE EXPANSION VALVE

9. Expansion valve not open sufficiently.

If the expansion valve supplying liquid refrigerant to the ice cream refrigeration coil is not open sufficiently (too high a super-heat) the temperature of the ice cream jacket will be too high.

The remedy is to open the expansion valve gradually by turning it in or clockwise one-quarter of a revolution at a time until the frost line appears on the heat interchanger. When the frost line appears on the heat interchanger it is then known that the entire ice cream refrigeration coil is being used effectively and efficiently.

It must be remembered that the expansion valve has nothing to do with the temperature but merely controls the amount of liquid refrigerant which enters the refrigeration coil.

10. Moisture in the system.

Moisture in the system will invariably freeze on the needle of the ice cream expansion valve, holding it shut so that no refrigerant will pass into the refrigeration coil. If the system has a sufficient charge of refrigerant as indicated by a sight gauge, and an adjustment of the expansion valve makes no change in the position of the frost line, it is most likely that moisture is frozen on the needle.

The correct remedy is to either install a refrigerant drier or to use one of the more recent chemical combinations such as Ice-X.

Merely placing warm rags on the expansion valve to thaw it out temporarily by no means corrects the trouble. The drop of moisture which froze on the expansion valve needle holding it shut is merely forced into the cold ice cream evaporator when warm rags are placed on the valve. Very likely the moisture will then freeze in the evaporator.

If these drops of moisture in the refrigerant evaporator do not freeze to the copper tubing, it is likely that they will be carried through the entire evaporator into the suction line. Here the drops will probably melt and the trouble will again repeat. The moisture must be eliminated before the difficulty will be completely eliminated.

11. Shortage of refrigerant.

If the system is short of gas, there will not be sufficient refrigerant in the expansion coil to properly refrigerate the ice cream. This point may be determined definitely by means of a liquid line sight gauge. If the expansion valve hisses for a large portion of the time, it is an indication that all gas or portions of gas instead of liquid refrigerant are passing through the valve.

The remedy is to add sufficient refrigerant to stop the sight gauge from flashing or to stop the expansion valve from hissing continuously. After adding refrigerant, the expansion valve should be adjusted to bring the frost line up to the heat interchanger.

12. Expansion valve strainer plugged.

If the strainer in the liquid line or at the expansion valve is plugged, the refrigeration circuit will not receive sufficient refrigerant. The remedy is to replace the plugged strainer with a new one or to clean the old one.

13. Expansion valve capillary line too cold.

For the successful operation of the thermostatic expansion valve, the bulb of the expansion valve must be colder at all times than the capillary line or any other portion of the valve power element.

It is possible when installing or servicing an expansion valve to bend the capillary line in such a position that it will touch some point colder than the bulb itself. The bulb must be installed in the well provided for it at the rear of the ice cream jacket.

If the capillary line touches the expansion coil, it is very likely that the capillary line will become colder than the bulb. Under these conditions the expansion valve will be closed before refrigerant enters the ice cream refrigeration coil. The capillary line will become the controller rather than the bulb.

The remedy is to carefully bend the capillary line so that it will not touch any of the colder refrigeration lines.

Similarly it is necessary to so locate the bulb that it will not warm up at a faster rate than the evaporator itself during the off-cycle. The soda fountain manufacturer has taken care of this point in his design of the soda fountain. However, it is important for the service engineer to remember this in making any expansion valve replacements.

CAUSE—CONDENSING UNIT

14. Condensing unit switch cut-in point too high.

If the condensing unit switch cut-in point is too high, the ice cream will warm up during the idle period. During the daytime when water is being drawn from the draught arm, the condensing unit will be started several times each hour because of the pressure built up in either the water-cooling refrigeration circuit or the jar enclosure circuit.

However, when no water is being drawn, or when the jar enclosure circuit is being defrosted, the condensing unit switch must be adjusted to start the system at least two to three times each hour. Recommended setting for the condensing unit switch on Russ fountains have been given in a previous article.

15. Condensing unit switch cut-out point too high.

If the cut-out point of the condensing unit switch occurs before the cold control breaks the electric circuit thereby permitting the solenoid valve to close, it means that the temperature in the ice cream jacket has not been reduced to the point set by the cold control. The cold control must break the electric circuit at the solenoid valve before the condensing unit is allowed to stop.

If the condensing unit's cut-out point is set too high, permitting current to pass through the cold control and solenoid valve continuously, the solenoid valve will overheat and eventually burn out.

The remedy is to lower the cut-out point of the condensing unit. The proper recommendation for the condensing unit switch setting has been given.

Each time the cut-out point of the condensing unit is changed, the thermostatic expansion valve controlling the jar enclosure circuit must be readjusted to bring the frost line to the desired point. Since the jar enclosure refrigeration circuit is not fitted with any control valves, its frost line will be dependent largely upon the cut-out point of the condensing unit. Obviously whenever the condensing unit cut-out point has been changed, the jar enclosure expansion valve will require readjustment.

16. Condensing unit valve not open.

If either the liquid line or suction line valves of the condensing unit are closed, no refrigeration will be obtained. The obvious remedy is to open the valve.

17. Condensing unit high pressure switch breaks the electric circuit.

If the switch of the condensing unit is being cutout by high pressure, the system will receive refrigeration at irregular intervals. The remedy is to locate and correct the cause of the high pressure.

'Facsimile Broadcast' Chain A Reality

CINCINNATI—Plans for the formation of the first experimental facsimile chain to be known as the Mutual Facsimile Network were completed here recently when officials of three Mutual network stations, WGN, WOR, and WLW announced that regularly scheduled facsimile transmissions were to be inaugurated on March 18 among the three participating stations.

This is said to mark a new field of radio broadcasting, for facsimile is the transmission of printed matter and pictures over the air for identical reproduction at the receiving end.

On March 18 the network began operating from 2 to 3:30 a.m. EST, with the stations alternating in sequence as they present their 30-minute transmission periods. The service will be made available later to all Mutual network stations.

At the present time there are approximately 1,000 facsimile receivers in operation within the service area of the facsimile network.

Springer Is Promoted By Cutler-Hammer

MILWAUKEE—J. C. Springer has been named assistant credit manager of Cutler-Hammer, Inc., manufacturer of electrical controls. Mr. Springer has been a member of the Cutler-Hammer organization since 1928, serving for several years in the company's Cleveland sales office and quarters sales office here.

Westinghouse Issues New Book on Motors

EAST PITTSBURGH, Pa.—Westinghouse Electric & Mfg. Co. has issued a new leaflet describing its type FJ capacitor-start fractional-horsepower motors for refrigerators, water coolers, stokers, pumps, compressors, machine tools, and similar applications.

These motors are available in sizes from ⅛ to ¾ hp. at all standard speeds for operation on either 110 or 220 volts. Motors rated at ¼ hp., 1,725 r.p.m. and smaller, are single voltage; ⅓ hp. and larger are dual voltage. All will operate satisfactorily within 10% of rated voltage, the manufacturer claims.

Features listed by the company for the FJ motors include: long-life automatic starting switch; "no-bump" bearings which absorb end-thrust shocks; three-way conduit box to simplify wiring; silent, cool-running motor; sturdy but lightweight frame and primary; and specially machined brackets.

Copies of the descriptive folder may be obtained by writing to the company.

Uses of Eyeshields Are Prescribed

DETROIT—Illustrating and describing the many different types of eyeshields manufactured by the company for various occupations and uses, a new folder has been issued by Jackson Electrode Holder Co. here, maker of industrial safety equipment.

Why Curtis is the *Extra Profit* Line

THE Curtis Refrigerated Store and Office Cooler materially increases your interest in the Curtis line of refrigeration and air conditioning equipment since it is another reason why you'll make more money handling Curtis products. It opens up a new market for the Curtis dealer — makes possible more sales and profits.

Here is a complete factory designed, packaged air conditioning unit—Mechanically cools, dehumidifies, circulates and filters the air — Adaptable for heating, too — Easily installed — Two sizes, 3 and 5 tons.

If your present line does not include packaged units as well as a complete range of remote equipment, get in touch with Curtis at once.

Wire or write today.

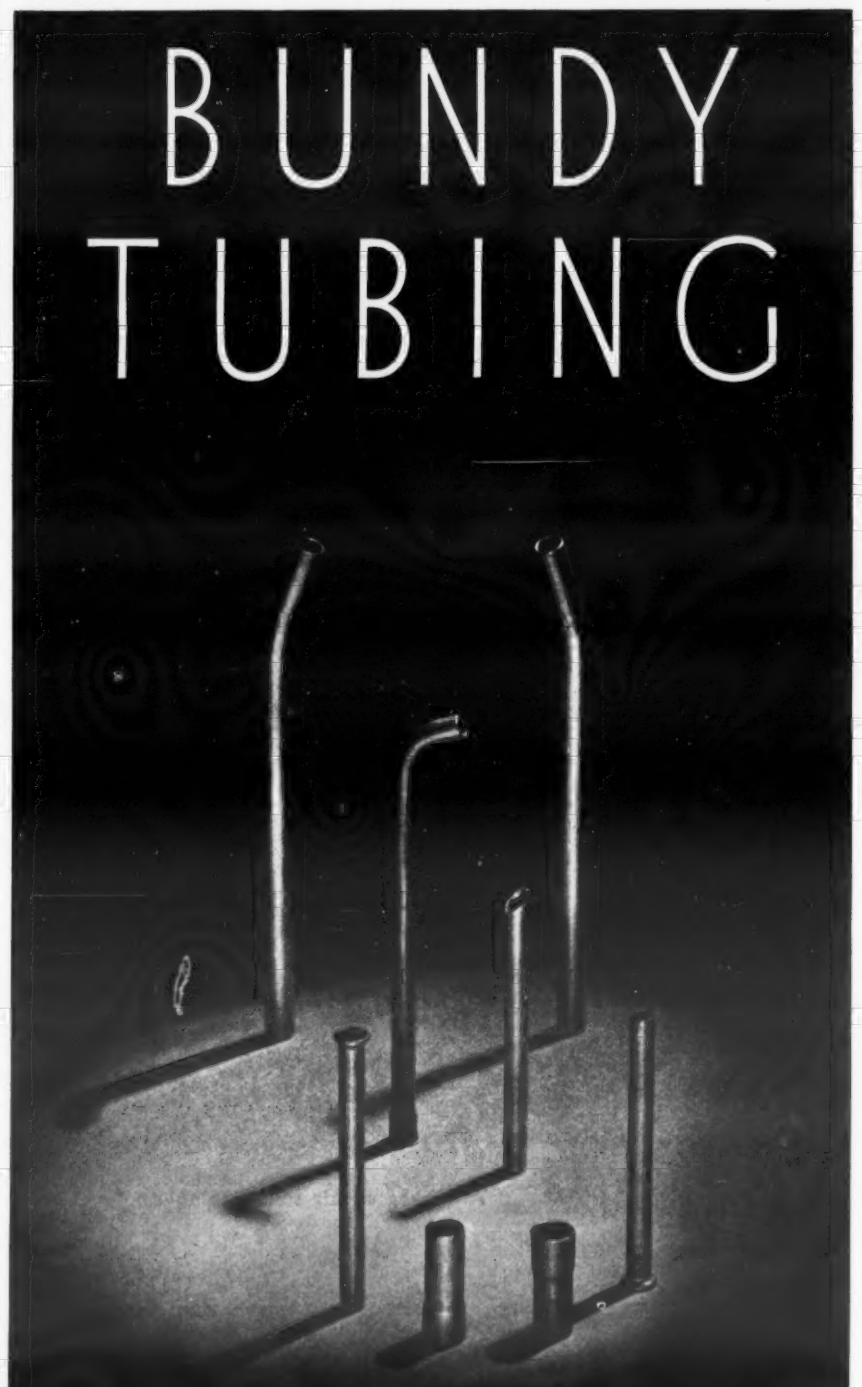
45 Air Cooled Units—42 Water Cooled Units—1/6 to 30 h.p.

CURTIS REFRIGERATING MACHINE CO.
Division of Curtis Manufacturing Co.
1912 Kienlen Ave. St. Louis, Mo.

CURTIS REFRIGERATION AIR CONDITIONING and COMMERCIAL

"Builders of Condensing Units Since 1922"

BUNDY TUBING



Steel tubing, copper coated inside and out

BUNDY TUBING CO.
DETROIT

Industrial Relations

'Multiple Management' Gives Employes Voice In Business, Improves Wages

BALTIMORE — "Multiple management" has enabled McCormick & Co. of this city to increase salaries and bonuses; to adopt a minimum wage scale for unskilled labor that is more than double the scale in the former peak year, 1929; to offer a week's vacation with pay for every factory employe, and to give seven additional holidays with pay throughout the year, declared Charles P. McCormick, president of the company, in speaking before the meeting of the National Warm Air Heating and Air Conditioning Association held recently in Cincinnati, Ohio.

The set-up of multiple management in McCormick & Co. was described by Mr. McCormick, who said that the organization of the Junior Board of Executives in 1932 was the first step made by the concern toward management by many. All executive-minded men, young or old, who are not on the Senior Board of Directors are eligible to the Junior board—the purpose of which is to function for the advancement and progress of the business and also to give members experience for promotion to the Senior board.

"They were given power to govern themselves, to discuss, to argue, and to submit all unanimously approved recommendations for ratification by the president or Senior board," Mr. McCormick explained.

"You will note that by this means one single, constructive sober-minded individual can prevent any radical action from being recommended. Their action is minimized by ther inability to carry out what they recommend, therefore the authority still rests in the hands of the Senior Board of Directors, and the company is protected by having only sound recommendations."

Mr. McCormick pointed out that at the same time the Junior board was formed, a similar plan was put into effect in the factory. The Factory Executives Board, which is comprised of representatives from foremen, mechanics, plant superintendents, and chemists, deals exclusively with factory problems. Like the Junior board, Mr. McCormick explained, recommendations must receive the unanimous approval of board members before they are placed in the hands of the president or Senior Board of Directors for approval.

The third step in the multiple management plan was the organization of the McCormick Sales Board, which, Mr. McCormick stated, was patterned after the general sales board plan. This board meets semi-annually to discuss merchandising and advertising problems.

"It is remarkable what these three boards have been able to do in changing the general aspect of our business," declared Mr. McCormick. "There is no question now about where a youth can get promotion. By the same reasoning, every youth has an opportunity to show what he has in competition with men of like age and energy.

"The factory man, through his board, has the opportunity to study at first hand, labor costs, wages and hours, and the necessity of making a profit when all three are patched together. Multiple management has changed the atmosphere of our business in such a way that we no longer have office, factory, or sales politics."

Mr. McCormick explained that in order to prevent these three groups from becoming stagnant or political, three active members must be replaced by three new men at the elections held every six months, but that the former members may be returned at the next election.

At the monthly meetings of the Junior board everything, from the buying of expensive office equipment to the sponsoring of new employes, is covered. It is the duty of Junior board members to take a new employe, who shows possibilities and sponsor him for two months—teach him not only the way to run the business but also the spirit of the business.

"Multiple management would be fine to put in any business, but it will fail unless the head of the business is willing to delegate the proper power and authority to these boards so that they may demonstrate their aggressiveness and their efficiency," Mr. McCormick pointed out.

"Also if they (board members) are not compensated through a bonus plan of some sort similar to the one we have worked out, they will feel that they are just being used as a planning board without being remunerated for their work. It might interest you to know that today whenever bonuses are given, the Senior board members receives exactly twice as many dollars as the Junior and Factory board member receives.

"The fundamental principle of multiple management is to promote efficiency and happiness in one's work, and with the management (from the top down) in accord with taking steps to achieve this principle or goal, this problem will be solved and will bring about greater coordination between the two factors of business which should work hand in hand—capital and labor—for they are both after the same objective."

20th Century Fund Plans Labor Bargaining Study

NEW YORK CITY—Dr. Harry Alvin Millis of the University of Chicago has been appointed research director of the impartial study of collective bargaining in the United States being undertaken by the Labor Committee of the Twentieth Century Fund, according to Evans Clark, executive director of the fund.

Dr. Millis, a specialist in labor relations, a former president of the American Economics Association, and author of three standard economics treatises, has arranged a leave of absence from the University of Chicago and is to begin organizing the Labor Committee's research program in New York immediately.

The Twentieth Century Fund's Labor Committee was originally appointed in 1934 to make a special study of the role of government in labor relations, and the report which it sponsored, "Labor and the Government," was published in 1935.

Commenting on the new study, Dr. Millis said:

"We plan to develop a non-partisan factual picture of the present status of collective bargaining in some 15 representative industries of the United States with special reference to the various forms it has taken and the ways in which it actually works. We shall use a small experienced staff to obtain facts that will illustrate conditions, policies, and procedures making for success in bargaining relationships and for industrial peace, as well as to examine the pitfalls and difficulties which beset newly unionized industries without long-developed techniques. The findings will be related to the recent reports of the President's Commission on Industrial Relations in Great Britain and Sweden." William H. Davis, a member of the President's commission, is chairman of the fund's labor committee.

Chiefly upon the basis of the facts gathered by Dr. Millis and his staff and those contained in the President's commission reports, the fund committee will propose specific policies for the improvement of industrial relations in the United States.

The industries to be studied in detail by Dr. Millis and his staff for the Twentieth Century Fund's Labor Committee are to be chosen from a list of industries and trades in which there are widely different conditions. The committee has decided to study, if feasible, the fields of newspaper publication, book and job printing, the men's clothing industry, the manufacture of women's wear, steel, rubber, building, hosiery, and railroads.

In some of these fields unions are well established and functioning relatively smoothly, while in others there are varying degrees of union activity with varying reactions to it.

The committee regards its proposed studies of labor relations in specific industrial fields as the "heart" of the research program. Other topics to be considered are the status of collective bargaining prior to 1933; recent collective bargaining legislation, including experience under the National Recovery Administration, the Wagner Act, and the National Labor Relations Board; the rapid spread of unionization since 1933, particularly the growth of industrial unionism and AFL-CIO rivalry; legal status of unions and agreements; and a general appraisal of "how collective bargaining has worked."

The Twentieth Century Fund was founded and endowed by the late Edward A. Filene.

Salesmen & Factory Men Both Indispensible, Revere Head Says

NEW YORK CITY — "Salesmen get the first order, but factory men get the second," is the theme of the fourth in a series of letters sent by Revere Copper & Brass, Inc. to its employes in its new "Know Your Company" plan.

The letter, written by Charles A. Macfie, vice president and general sales manager, emphasizes the fact that success in most business is a matter of team play.

"Salesmen are absolutely essential," writes Mr. Macfie. "Someone has to 'ring doorbells'—to be the front line in our contact with customers and prospective customers. But also important in a sales way are the people who work in our mills. Whether or not our company will succeed and grow depends on the orders the salesmen bring in plus the service given those orders."

Pictures demonstrating the use of copper in numerous industries were included in the letter, and Mr. Macfie points out that "Our success in getting and holding orders in these industries depends on our ability to keep our customers satisfied.

"Most business enterprises operate on a narrow margin. They cannot afford to use copper or copper alloy materials that do not meet their requirements closely with respect to quality, price, or delivery. No salesman can control these factors. They are controlled in the mill. Whether or not we make a sale, or our competitor gets it, is often decided as much by the men who make Revere products as by the men who sell them."

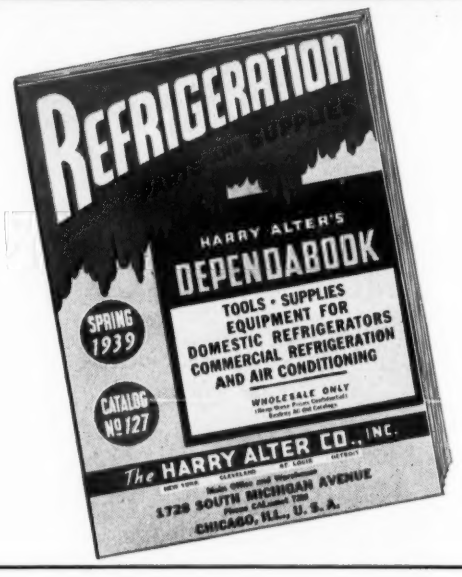
Chicago Utility Seeks New Ideas From Employes

CHICAGO — Seeking new ideas, methods, and devices to improve the company's operations, build its load, or improve its customer service and employe relations, Commonwealth Edison Co., local utility, is sponsoring what it terms a "Short Paper" contest that is open to all employes.

A total of $550 in cash awards will be distributed among writers of the best papers in each of five groups —financial, technical, commercial, service, and a special classification for experienced writers. Six prizes —amounting to $40, $30, $20, $10, $5, and $5, respectively—will be awarded in each classification.

Papers in any of the first four classifications will be limited to three typewritten pages, an additional page of pictures, and another of charts or tables. Papers by experienced writers will be limited to twice this length.

The committee in charge of the contest has expressed a preference for papers based on the writer's actual experiences with the company.



"The results from our advertising in Air Conditioning & Refrigeration News over a period of years have proved to us that your paper is read with interest by active buyers."

-- Irving Alter, The Harry Alter Co.

A jobber of air-conditioning and refrigeration parts, supplies, and equipment with eight warehouses in five big market centers has more of an opportunity to check the results of his advertising than most advertisers.

A jobber gets quick, tangible returns in the form of inquiries and sales from his advertising and is in a position to know whether or not his advertising money is well spent.

The fact that The Harry Alter Co. has been a consistent advertiser in the News for several years indicates not only the degree of interest with which Air Conditioning & Refrigeration News is read by its subscribers, but it also indicates their purchasing power.

Air Conditioning & Refrigeration News
"The Newspaper of the Industry"

Outsell all others with
Copeland

HIGHEST EFFICIENCY!
LOWEST OPERATING COST!
LONGEST TROUBLE-FREE SERVICE!

Commercial Refrigeration
The efficiency, economy and dependability of all Copeland Commercial Units make prospects easy to find, make sales easy to close. Our twenty years of leadership in commercial refrigeration are evident in every unit.

COPELAND REFRIGERATION CORPORATION, Sidney, Ohio
INVESTIGATE COPELAND'S COMPLETE LINE OF HOUSEHOLD REFRIGERATORS AND WATER COOLERS

CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, $2.00, additional words four cents each. Three consecutive insertions $5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

COMMERCIAL REFRIGERATION sales manager needed by Carrier Corp. as result of present commercial refrigeration expansion program. Salary and bonus. Please write, stating experience, qualifications, and references. Box 1127, Air Conditioning & Refrigeration News.

WANTED: SALESMAN to sell Kelvinator commercial refrigeration and air conditioning equipment in moderate sized eastern city. Good opportunity for right person. State qualifications and references. Address Box 1129, Air Conditioning & Refrigeration News.

WANTED: REFRIGERATION Serviceman. Must be thoroughly experienced on all makes, both domestic and commercial. Must have had experience installing commercial refrigeration equipment and be willing to move to medium sized city on East Coast. Steady all-year-'round job. State experience, qualifications and salary desired. Address Box No. 1130, Air Conditioning & Refrigeration News.

POSITIONS WANTED

MECHANICAL ENGINEER. 16 years' experience in household refrigeration and air conditioning; cabinet and unit design, developments and tests. Thorough knowledge of service set-ups and extensive experience in contacting dealers and distributors and handling their problems. Capable advancing new ideas on major household appliances and following through with design and production. Box 1126, Air Conditioning & Refrigeration News.

SHOP AND Service Manager with ten years' refrigeration experience. Four years in charge of shops for national distributor remodeling and completely rebuilding several makes and types of refrigerators. Considerable experience hiring and training men. Economically inclined and efficient. References from present and past employers. Box 1131, Air Conditioning & Refrigeration News.

GRADUATE REFRIGERATION Engineer, several years' practical experience estimating, installing and servicing all types of equipment. Also selling of same. Am 31 years of age and married. Can give outstanding ability and character references. Desire connection with well-established concern where I can prove my ability. Box No. 1132, Air Conditioning & Refrigeration News.

DO YOU NEED a young, intelligent, aggressive, personable, and ingenious engineer? 24 years, M.E. degree, heating and ventilating thesis, two years' experience research and development engineering with prominent refrigeration and air conditioning manufacturer. Knows heat and cooling loads and methods of recommendation calculations of leading manufacturers. Eastern location preferred but not essential. References. Box 1133, Air Conditioning & Refrigeration News.

YOUNG MAN wants position in commercial refrigeration or air conditioning business where advancement is possible. Age 28, 4 years' college plus 2 years' refrigeration and air conditioning training; athletic; likes hard work; inventive; ambitious; reliable; 100% honest; single; go anywhere. Address Box 549, Republic, Pa.

ENGINEERING SERVICE

REGISTERED CONSULTING Engineer with twenty years' experience designing and developing heating, refrigerating, and air conditioning equipment and systems. Complete staff of experts and laboratory available for designing and developing products or laying out systems. Will furnish ideas, or work out yours. F. O. JORDAN (ASRE), 2150 Lawrence, Chicago.

FRANCHISE AVAILABLE

COMMERCIAL LINE refrigerator display cases, walk-in coolers, and refrigerators; also direct draw, mechanically-cooled beer coolers. Sell with Ehrlich compressors or with any other make. Attractive discounts, also financing arrangements to help sell. 70 years in business. Write for full information. EHRLICH REFRIGERATOR MFG. CO., St. Joseph, Mo.

STANDARD AUTOMATIC Oil Burner with 3 Minneapolis-Honeywell controls, $58.50. Write for quantity discounts and available territories. Lowest prices since 1925 in the manufacturing of this burner. Equipped with Standard resilient mounted long hour motor, Tuthill fuelstat, Torrington fan. NATIONAL ARCOIL CORP., 471 Broad Street, Newark, N. J.

ONE OF oldest domestic refrigerator manufacturers is interested in obtaining competent, productive representation for several eastern and southeastern states. An exclusive product with dramatic features and unusual sales appeal in today's market, backed by a real dealer profit picture. To qualify, applicants must be thoroughly familiar with trade setup in territory and should already represent other established lines which could be soundly complemented with our proposition. In writing, give age, resume of experience, other lines now carried, and territory. All correspondence confidential. Box 1134, Air Conditioning & Refrigeration News.

EQUIPMENT FOR SALE

BRAND NEW Emerson motors in original factory cartons, 110-220 volts, single phase, 1,725 r.p.m., bronze bearings, ½" shaft diameter, 2" shaft extension, very quiet running. ⅙ H.P.—$5.85; ¼ H.P.—$7.00; ⅓ H.P.—$9.00, in lots of six or more. INTERSTATE REFRIGERATOR CORP., 96 Fifth Avenue, New York, N. Y.

DEALERS AND SERVICEMEN: Offering Kelvinators, General Electrics, Westinghouses, Frigidaires, as is, as low as $8.00. Guaranteed fully equipped. Also Frigidaire compressor units, all sizes. We have a quantity of used ice cream cabinets, capacity four 2½ gallons. Cold control. Write for prices. LANDOR WAREHOUSE CO., 53 East 10th St., New York City.

REPAIR SERVICE

GENERAL ELECTRIC and Westinghouse hermetic unit replacement and rebuilding service. One year unconditional guarantee. All units are completely rebuilt on a modern production line, tested through every step of rebuilding with complete test equipment, subjected to exhaustive operation tests for wattage, efficiency, quietness and then Duco finished. General Electric DR1, DR2, and Westinghouse, $30.00. Quotations furnished on other models. Quick service—guaranteed work. REFRIGERATION MAINTENANCE CORPORATION, 321-27 East Grand Avenue, Chicago.

DOMESTIC CONTROLS repaired: Ranco pencil $1.75, Ranco box $2.00, General Electric $2.00, Tag $2.00, Cutler-Hammer $2.00, Penn $2.00, Bishop Babcock, $2.50, Majestic $2.50, Penn magnetic $2.50, G. E. Frigidaire $2.50. In business over 20 years. Our name is our guarantee. UNITED SPEEDOMETER REPAIR CO., INC., 342 West 70th Street, New York City.

CONTROL REPAIR service. Your controls repaired by expert mechanics, with special precision equipment. Supervised by graduate engineers. We stress perfection and dependability before price. One year guarantee on domestic controls. Any bellows operated device repaired. HALECTRIC LABORATORY, 1793 Lakeview Road, Cleveland, Ohio.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

Manufacturers are invited to write for complete details regarding Universal Cooler refrigerating units.

Universal Cooler Corp., Detroit

GET PEAK PERFORMANCE with SPORLAN Controlled Performance VALVES

BUSH FINNED COILS FOR COOLING — HEATING AND AIR CONDITIONING BUSH MANUFACTURING CO. HARTFORD, CONN.

PENN Leads in AUTOMATIC SWITCHES AND CONTROLS Write for Catalog PENN ELECTRIC SWITCH CO. GOSHEN, INDIANA

Live Wire Co. Changes Store, Adds Products

GOLDSBORO, N. C.—Live Wire Electrical Co. has renovated its store here and is handling the G-E line. Lawrence McIntyre and Claude Parks are managers.

Jobber Activities

800 Attend St. Louis Jobber's Own Show

ST. LOUIS—More than 500 people registered at the second annual Refrigeration Exhibition held recently at the Kingsway hotel here by R. E. Thompson Co., refrigeration supply jobber in St. Louis and in Peoria, Ill., and it is estimated that at least 300 more visitors dispensed with the formality of signing their names because of the long lines in front of the registration desk.

Invitations were sent out well in advance of the show to people in all branches of the trade, and as a result the attendance included commercial refrigeration managers, department heads from many prominent manufacturers, and others high up in refrigeration circles, as well as the usual quota of service men.

Students of the refrigeration and air-conditioning classes of Rankin Trade School and Hadley Vocational School took advantage of the opportunity to gather latest literature on various refrigeration products.

Many manufacturers of refrigeration parts and supplies took advantage of the opportunity to display their products in booths provided for the purpose around the walls of the three connecting hotel parlors in which the exhibit was staged. Names of these firms, and of the representatives who tended their booths, follow:

Spoehrer-Lange Co., Bill Carmody; Kerotest Mfg. Co., G. C. Taylor; Marlo Coil Co., L. C. Pellegrini; Ranco, Inc., Bob Cook and Mr. Dunlop; Alco Valve Co., George Roepke; Penn Electric Switch Co., Aerovox Corp., and Tecumseh Products Co., Jules W. Beneke; Prest-O-Lite Co., W. L. Kelly and R. O'Neel; Chase Brass & Copper Co., Inc., Bud Corrington and John Dumser.

Peerless of America, Inc., Mel Knight and W. A. Honeychurch; Imperial Brass Mfg. Co., Charles Anderson; White-Rodgers Electric Co., Frank Fillo and Les Blough; Detroit Lubricator Co., Jack McKenna; Electrimatic Corp., H. W. McPherson; Bush Mfg. Co., Henry Brockgreitens; Commercial Coil & Refrigeration Co., William Gauger; Century Electric Co., A. R. Niemoeller; Henry Valve Co. and Dole Refrigeration Co., Jerry Wilkerson.

Conditioning Installed By Williams & Co.

PITTSBURGH—Light and sound, as well as air, are thoroughly "conditioned" in the headquarters general office of Williams & Co., refrigeration and air-conditioning supply jobber.

While the year-around air-conditioning equipment insures proper control of temperature and humidity, indirect lighting provides glareless, shadowless light throughout the office, and an acoustic ceiling deadens the usual office noises.

H. E. Williams is president of the company, E. C. Edmundson is vice president and general manager, and Chas. Johnston is secretary-treasurer. H. S. McCloud heads the firm's refrigeration department.

Refrigeration Equipment Formed In Kansas City

KANSAS CITY, Mo.—Formation of Refrigeration Equipment Co., located at 101-105 East 24th St. here, was announced recently. The firm will deal in refrigeration and air-conditioning equipment and supplies, strictly on a wholesale basis.

The firm consists of Ernie L. Tramposh and W. L. Davidson, both of whom have been with the Forslund Pump & Machinery Co. of Kansas City for the last few years. Previously, Mr. Tramposh was for several years with the local Frigidaire sales division. Mr. Davidson was for some time with Richards & Conover, local Kelvinator distributor.

Case Co. Adds Stock For Binghamton, Syracuse

BINGHAMTON, N. Y.—A complete stock of refrigeration parts and supplies is now being carried by the Binghamton and Syracuse, N. Y. branches of W. A. Case & Son Mfg. Co., mill and factory supply house.

This new department will be introduced to the trade at an open house scheduled to be held March 23 by the branch here. Manufacturers represented by this jobbing firm will have product exhibits and representatives present at the Case warehouse during the open house.

The Case company's Binghamton branch, of which F. M. Meier is manager, is located at 1 Lewis St. Address of the Syracuse branch is 115 N. Geddes St.

Chaplin Heads Wholesale Trade For Wolverine

DETROIT—Howard H. Chaplin has been made a member of the sales staff of Wolverine Tube Co. and has been placed in charge of the company's wholesale trade. Mr. Chaplin, who came to the Wolverine organization from American Radiator Co., has a background of 15 years in the jobbing business.

Herman Goldberg Co. In New Quarters

CHICAGO—Herman Goldberg Co., manufacturers' representative here, has moved to new and larger quarters in the Civic Opera building, 20 Wacker Dr.

Blount Joins Electric Supply

NEW ORLEANS—James Blount, for several years advertising manager for Walther Bros., Inc., Philco distributor, has taken a similar position with the Electrical Supply Co.

'Conditioning' Now In Vacuum Cleaner

DETROIT—And now "air conditioning" has entered the vacuum cleaner field. Shown at the recent Detroit Builders' Show was the "Rexair" vacuum cleaner, which is said to condition and humidify the air used in the cleaner by the use of a water dust trap designed to keep the air stream free from dirt and dust.

The water, contained in the base of the motor unit, traps the impurities in the air, sending the cleaned air through the separator and back into the room. The water basin dust trap may be washed after each use. New full-strength germicidal is placed in clean water before each cleaning operation.

The separator can be removed for scalding after each use, to insure sanitation and a clean air stream.

The unit has a variety of uses. It is claimed that it will remove odors from a room by a special hose attachment, it will mentholate a clothes closet by adding menthol crystals in the water used, and that it also may be used as a treatment for asthma, sinus infections, colds, and hay fever. These special applications of the cleaner are made possible by attaching the hose in various desired positions.

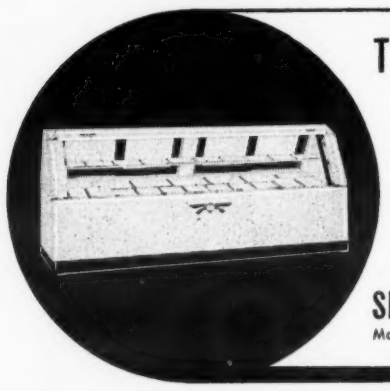
MASTERCRAFT
ADJUSTABLE PAD AND CARRYING HARNESS
The most efficient and economical equipment made for handling refrigerators safely and without scratching or marring. Pad is separate from harness and both adjustable to all styles and sizes of cabinets. Efficient, sturdy, easily and quickly applied.
Adjustable Pad, $3.30 each
Adjustable Harness, $6.00 each
Name of refrigerator attractively lettered on pad at 50¢ extra.
f.o.b. Chicago.
Write for folder and prices on pads for refrigerators, washers, ironers, ranges, radios, etc.
Pat. Appl'd for
BEARSE MANUFACTURING CO.
3815-3825 Cortland Street, Chicago, Illinois
Incorporated 1921

KRAMER AIR-COOLER CONDENSERS WITH OR WITHOUT LIQUID RECEIVERS
KRAMER TRENTON AUTO RADIATOR WORKS · TRENTON, N. J.

Ask for VIRGINIA EXTRA DRY ESOTOO • V-METH-L
Drop in at your nearby Virginia jobber. He has good reason to be proud of his complete parts stock, his service, and his quick delivery.
VIRGINIA SMELTING COMPANY
WEST NORFOLK, VIRGINIA

SERVEL Silver Fleet
Smooth and silent as a sailboat, Servel's "Silver Fleet" refrigerating machines offer you a standard of operating efficiency that is 3 to 5 years ahead of the field. Ask for the new 72-page catalog. Servel, Inc., Electric Refrigeration and Air Conditioning Division, Evansville, Ind.
COMMERCIAL REFRIGERATING MACHINES

THE BUYER'S GUIDE



THE PROFIT LINE FOR '39

Refrigerator and Compressor sales go together. SHERER offers a complete line of cases, coolers and boxes to be sold with your compressors.

Write for catalog and franchise details, mentioning territory desired.

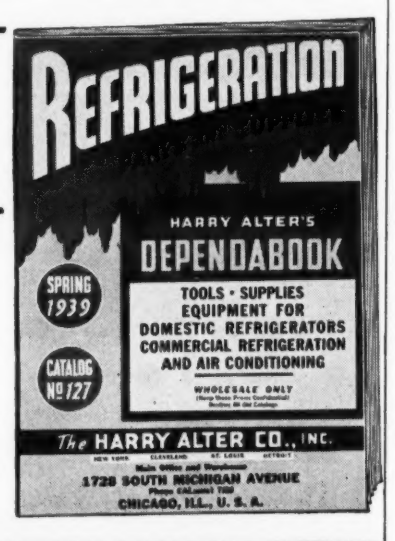
SHERER-GILLETT CO., Marshall, Mich.

Manufacturers of Refrigerated Display and Storage Equipment

It's New!

IMPORTANT

Send today for this big, new catalog of Air Conditioning and Refrigeration Parts and Supplies—JUST OFF THE PRESS—and full of real values. Please write on your letterhead. We only sell wholesale.



THE HARRY ALTER CO.

1728 S. Michigan Avenue, Chicago, Illinois

3 CHICAGO BRANCHES – NORTH, WEST, SOUTH

NEW YORK 161-163 Grand St. | DETROIT 5013 John R. St. | CLEVELAND 4506 Prospect Ave. | ST. LOUIS 2910 Washington Ave.

LARKIN

Instantaneous

Water Coolers

will make you More Money...

when you sell these coolers, your customers enjoy trouble-free operation.

Read what M. Wyman Glenn, Nehi Bottling Co., Centralia, Ill. says . . . "We have been well pleased with its operation. At no time during this past summer did we fail to get 35 to 38° water. The cooler has been trouble-free, and I feel free to recommend it to any bottler."

write today for complete engineering and sales data

Built only by

LARKIN COILS, INC.

General Office and Factory

519 FAIR STREET, S. E., ATLANTA, GA.

NEW YORK BRANCH, 57-59 E. 11th St.

For Bottling Plants, Bakeries, Drinking Water Systems and Other Cooling Requirements.

31 Sizes

Hundreds of Satisfied Users

Installations In Four Cities Made During 1938 Reported

SAN FRANCISCO

SAN FRANCISCO—A total of 138 air-conditioning systems having an aggregate capacity of 1,345 hp. were installed on the power lines of Pacific Gas & Electric Co. in 1938 in San Francisco and numerous other cities and towns in northern California, reports R. E. Fisher, vice president in charge of sales and public relations.

In 1937, 156 installations totaling 2,096 hp. were made, and prior to 1937 there were 897 jobs aggregating 5,367 hp. in use on Pacific Gas & Electric Co.'s lines.

PORTLAND, ORE.

PORTLAND, Ore.—Three air-conditioning installations having a total load of 5½ hp. were added to the power lines of Northwestern Electric Co. here in 1938, J. J. Goodman, chief clerk of the business development department, reports.

Two office air conditioners of 1 hp. each were installed for Crown Williametter Paper Co., and a 3½-hp. job was installed in Leonard's Restaurant & Card Room.

FERGUS FALLS, MINN.

FERGUS FALLS, Minn.—Approximately 75 air-conditioning systems employing commercial refrigeration equipment have been installed to date in the west-central Minnesota territory covered by Otter Tail Power Co., reports Carl J. Johnson, utility sales director.

Mr. Johnson estimated that an equal number of systems operating on water also have been installed, and that the total electric power load of all the air-conditioning systems is 250 hp.

About 75 household cooling units are now in use in Otter Tail's territory, Mr. Johnson added, their total load being approximately 50 hp.

FORT DODGE, IOWA

(Compiled by Fort Dodge Gas & Electric Co.)

Classification	Number of Installations	Hp.
Bank	1	10
Beauty Shops	2	10
Funeral Parlors	2	5
Coffee Shops	2	25
Restaurants	8	20
Stores, Retail	7	30
Theaters	5	50
Utility Co.	1	10
Fur Companies	2	10

Columbus Men Hear Talk On Air Distribution

COLUMBUS, Ohio—Principles of air conditioning as applied to correct air distribution and diffusion were outlined by F. J. Kurth at a meeting here sponsored by the Anemostat Corp. of America.

It was pointed out that the Anemostat is recognized by air-conditioning engineers and manufacturers as a method of air distribution which overcomes the problems of cold drafts and excessive ceiling heat.

Among the Columbus air-conditioning dealers who have made Anemostat installations are the L. R. Krumm Co., Delco-Frigidaire distributor; the Columbus Heating & Ventilating Co., distributor for Carrier; and the Good Housekeeping Shop, York distributor.

Types of Businesses Which Installed Air Conditioning Shown In Surveys

Editor's Note: Further surveys on air-conditioning installations in leading population centers of this country are published on this and the following page. The surveys list the installations by types of businesses for years prior to 1937, during 1937, during 1938, and the totals. Also published is a complete list of all installations made in Birmingham, Ala. during 1938.

Puget Sound Area

(Data Supplied by Puget Sound Power & Light Co.)

Classification	Prior to 1937 No.	Prior to 1937 Hp.	During 1937 No.	During 1937 Hp.	During 1938 No.	During 1938 Hp.	Total No.	Total Hp.
Offices, Private	11	17.0	8	59.0	2	12.0	21	88.0
Hospital	1	6.0	0	0.0	0	0.0	1	6.0
Bakeries	0	0.0	3	13.0	0	0.0	3	13.0
Stores	0	0.0	4	26.0	1	10.7	5	26.7
Beauty Shops	0	0.0	2	10.0	0	0.0	2	10.0
Church and School	0	0.0	0	0.0	2	0.5	2	0.5
Theater	0	0.0	0	0.0	1	20.0	1	20.0
Cafes	0	0.0	0	0.0	2	5.7	2	5.7
Total	**12**	**23.0**	**17**	**108.0**	**8**	**48.9**	**37**	**169.9**

Rochester, N. Y.

(Data Furnished by Rochester Gas & Electric Corp.)

Classification	Prior to 1937 No.	Prior to 1937 Hp.	During 1937 No.	During 1937 Hp.	11 Mos. 1938 No.	11 Mos. 1938 Hp.	Total No.	Total Hp.
Industrial	13	23,542.75	8*	1,952.25	4*	21.25	20	25,516.25
Office Building	1	128.0	1*	33.0	0	0.0	1	261.0
Offices	7	89.5	8*	20.25	8	24.75	28	134.5
Theaters	4	1,274.0	1	50.0	2*	96.0	6	1,420.0
Restaurants	15	301.25	4*	54.5	3	30.75	21	386.5
Hotels	3	79.0	1	8.5	2*	15.5	5	189.5
Stores	13	581.5	9*	78.25	6*	102.0	26	761.75
Radio Studio	1	4.0	1*	9.0	0	0.0	1	13.0
Library	1	265.0	0	0.0	0	0.0	1	265.0
Banks	4	169.5	1*	39.0	1	5.5	6	214.0
Funeral Homes	1	3.5	1	9.0	0	0.0	2	12.5
Newspapers	1	112.75	2*	95.0	0	0.0	2	207.75
Telephone Exchanges	3	77.25	1*	9.0	1*	8.0	3	94.25
Residences	21	38.75	9	14.25	2	4.75	32	57.75
Hospitals	1	1.0	0	0.0	2*	6.0	2	7.0
Municipal Building	1	3.75	0	0.0	0	0.0	1	3.75
Beauty Parlors and Barber Shops	0	0.0	3	37.0	1	2.0	4	39.0
Optician	0	0.0	0	0.0	1	5.5	1	5.5
Total	**..**	**26,671.5**	**..**	**2,409.0**	**..**	**322.0**	**..**	**29,589.0**

*One or more of these installations is an addition to previous equipment.

Denver, Col.

(Data Furnished by the Public Service Co. of Colorado)

Classification	During 1937 No.	During 1937 Hp.	During 1938 No.	During 1938 Hp.	Total No.	Total Hp.
Offices	5	30.5	3	6.75	8	37.25
Restaurants	4	17.0	0	0.0	4	17.0
Drug Stores	2	25.0	1	20.0	3	45.0
Funeral Parlors	2	25.0	0	0.0	2	25.0
Bank	1	15.0	0	0.0	1	15.0
Beauty Shop	1	3.0	0	0.0	1	3.0
Specialty Shops	5	73.5	2	3.5	7	77.0
Hotels (Including Dining Rooms)	3	65.0	0	0.0	3	65.0
Miscellaneous	2	7.0	1	5.0	3	12.0
Total	**25**	**261.0**	**7**	**35.25**	**32**	**296.25**

San Antonio, Tex.

(Data Compiled by San Antonio Public Service Co.)

Classification	Prior to 1937 No.	Prior to 1937 Hp.	During 1937 No.	During 1937 Hp.	During 1938 No.	During 1938 Hp.	Total No.	Total Hp.
Theaters & Auditoriums	10	2,663	0	0	0	0	10	2,663
Department Stores	15	1,042.6	15	473.75	13	1,139.5	43	2,655.85
Clubs, etc.	7	77.3	1	6	0	0	8	83.3
Restaurants, Coffee Shops, and Cafeterias	9	714.1	6	83	4	36.5	19	833.6
Office Buildings	4	724	1	241	2	48	7	1,013
Individual Offices	20	38.75	14	47.45	6	12	40	98.2
Broadcasting Studios	1	6	0	0	1	55	2	61
Testing Laboratories	2	67.25	0	0	2	4	4	71.25
Banks	2	327	0	0	0	0	2	327
Beauty Parlors	3	27	0	0	0	0	3	27
Brokers	1	28	0	0	0	0	1	28
Hospitals	3	22	0	0	1	95	4	117
Hotels	2	541.6	2	875	0	0	4	1,416.6
Funeral Homes	1	13	2	25	0	0	3	38
Drug Stores	2	29	1	10	1	12.5	4	51.5
Residences	35	61.5	12	28.25	21	76	68	165.75
Post Office	0	0	1	535	0	0	1	535
Florist	0	0	0	0	1	4.25	1	4.25
Church	0	0	0	0	1	6	1	6
Total	**117**	**6,382.10**	**55**	**2,324.45**	**53**	**1,488.75**	**225**	**10,195.30**

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Air Conditioning

Baltimore, Md.

(Data Supplied by Consolidated Gas, Electric Light & Power Co.)

Classification	Prior to 1937 No.	Prior to 1937 Hp.	During 1937 No.	During 1937 Hp.	During 1938 No.	During 1938 Hp.	Total No.	Total Hp.
Barber & Beauty Shops	10	89.0	3	23.5	5	19.0	18	131.5
Drug & Candy Stores	23	287.0	4	57.0	6	61.0	33	405.0
Department Stores	15	1,809.0	10	1,352.0	7	824.5	33	3,985.5
Food Stores	5	33.0	1	16.5	3	7.0	9	56.6
Public Buildings	6	420.0	0	0.0	1	212.0	7	632.0
Hospitals	7	72.0	0	0.0	3	69.0	10	141.0
Industrial	13	613.5	4	131.5	3	55.0	20	800.0
Restaurants	39	822.0	16	225.5	21	251.0	76	1,298.5
Offices	59	764.5	59	516.5	67	396.5	202	1,699.5
Banks & Brokerage Houses	10	509.0	2	78.5	3	44.5	15	632.0
Residences	33	78.0	63	71.5	80	101.0	192	272.5
Specialty Shops	31	408.5	22	400.0	12	131.0	65	939.5
Theaters	41	3,360.0	10	480.5	9	568.5	60	4,409.0
Miscellaneous	16	311.0	7	117.0	16	376.5	39	804.4
Single Self-Contained Units	33	40.0	0	0.0	(Included in Total)			
Total	**342**	**9,616.5**	**543**	**3,470.0**	**236**	**3,116.5**	**779**	**16,207.0**

Where Air Conditioning Was Installed In Birmingham During 1938

(Data Compiled by Birmingham Electric Co.)

Name	Make of Equipment	Hp.
Bank		
Steiner Bank	Airtemp	5.0
Barber Shop		
Empire Barber Shop	Frigidaire	3.66
Chapels		
Brown Service Funeral Co. (Bessemer)	Carrier	11.0
Brown Service Funeral Co. (Norwood)	Carrier	18.0
Johns Funeral Home	Carrier	3.5
Laboratories		
Pittsburgh Testing Laboratory	Frigidaire	0.5
Tennessee Coal, Iron & R.R. Co. (Fairfield)	Carrier	15.0
Offices, General		
Allen Rushton	York	0.75
Chicago Bridge & Iron Co.	Carrier	20.0
Dr. F. H. Clements	Carrier	0.75
Daniels Construction Co.	Carrier	6.75
Double Cola Bottling Co.	Carrier	3.0
Federal Building	Westinghouse	20.0
Frigidaire Corp.	Frigidaire	3.0
Gulf York Co.	York	5.0
J. Warren Leach	Airtemp	6.5
Sears, Roebuck & Co.	Hercules	0.5
Offices, Private		
Meyer Hotel Co.	Carrier	2.0
Moore, Handley Hardware Co.	Westinghouse	0.75
Tennessee Coal, Iron & R.R. Co.	Carrier	3.0
Residences		
R. I. Ingalls, Jr.	Carrier	0.75
Mrs. J. R. Irby	Carrier	0.75
Geo. M. Morrow	Carrier	0.75
Restaurants		
Birmingham Athletic Club	Airtemp	3.33
Faust Cafe	Westinghouse	10.0
Joe's Steak House	Westinghouse	20.0
John R. Thompson	Lipman	22.0
Todd-Aust Cafe	Frigidaire	15.0
20th Century Grill	Airtemp	3.33
White House Restaurant	Airtemp	3.33
Stores		
Burts Shoe Co.	Carrier	10.0
Emily Shop	Carrier	12.0
W. T. Grant Co.	Frigidaire	65.0
Haverty Furniture Co.	Carrier	40.0
Hill Grocery Co.	Carrier	10.0
Kaufman (tailor)	York	0.75
New Williams Store	Airtemp	5.33
Miscellaneous		
Birmingham Electric Co. (Auditorium)	Airtemp	15.75
WAPI (Radio Studio)	Carrier	2.0

Air Control Introduces New Register With 2-Way Control

MUSKEGON, Mich.—Full control of airflow, both vertically and horizontally, in air-conditioning installations is claimed for the "Air Control," a new register just announced by Air Control Products, Inc. here.

The register may be installed in a duct opening in any position, it is said, and can easily be adjusted to deflect air in any direction desired.

Vertical control of the airflow is provided by a series of movable shutters on the back of the register, which are connected to a knob on the front of the register for opening or closing the shutters.

Position of the shutters when open may be controlled by means of a small button below the knob. Any desired angle of deflection may be had from 15° upward to 30° downward, it is stated.

Horizontal control of the airflow is obtained by adjusting the vertical fins. A special tool is provided for this which engages the entire length of the fin.

The register features one-piece construction of fins and margin, designed to minimize breakage danger and to eliminate unnecessary working parts.

Air Control Products, Inc. also has announced a new simplified control for dampers in forced air ducts, said to be easy to install, and to be virtually unbreakable and rattle-proof.

The control is designed so that the tail bearing does not project beyond the edge of the damper, and also enables both ends of the damper to be tightly secured to the duct. The damper is operated by a handle which can only be installed in the same plane as the damper itself, thus indicating the angle of the damper inside the duct. Component parts of the control, including one-piece bearings, are of case-hardened, cadmium-plated steel.

Proposed Inspection Bill Is Killed

ALBANY, N. Y.—The McCaffrey bill proposing state inspection of air-conditioning systems has been reported killed by the assembly ways and means committee, headed by Abbott Low Moffat, Manhattan Republican.

J. A. Bowen Is Named Dealer For F-M Air Conditioning

GREENVILLE, Miss.—J. A. Bowen has been appointed Fairbanks-Morse air-conditioning dealer in the Upper Delta area.

A. T. Hall Named Dealer For Westinghouse Line

BENTON HARBOR, Mich.—A. T. Hall Co. has been appointed dealer here for Westinghouse air-conditioning equipment. Robert Sykora is manager.

Dunnagan & Rideout Co. To Distribute Airtemp

WINSTON-SALEM, N. C.—Dunnagan & Rideout Co. has been appointed distributor for Airtemp air-conditioning equipment.

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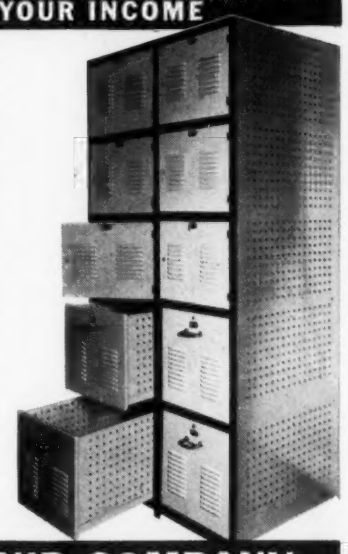

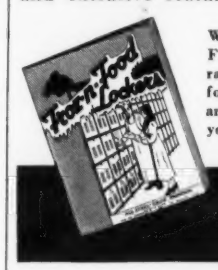

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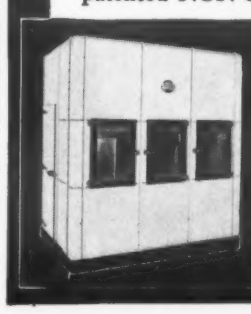

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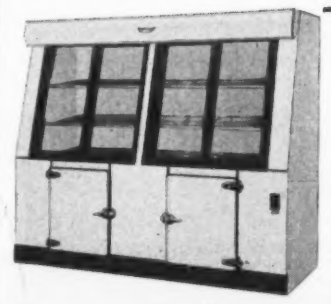

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Engineering

Characteristics & Functions of Various Chemical Drying Agents Described

Editor's Note: The NEWS concludes in this issue the discussion by Mr. McGovern on drying methods for refrigerating machines. Last week's article was concerned with dehydration by means of heat and vacuum, while this section discusses chemical dryers.

Received too late for inclusion in last week's section was a correction sent in by Mr. McGovern. In column 5, page 15, of the March 15 issue, in the paragraph on testing the dry gas flushing method by using a test paper impregnated with cobalt chloride, the text read " . . . cobalt chloride, which is blue in a humid atmosphere, red in a dry. . . ." The colors should have been reversed, since the paper will show *red* in a *humid* atmosphere and *blue* in a *dry*.

By E. W. McGovern, R. & H. Chemicals Dept.,
E. I. du Pont de Nemours & Co., Inc.

Chemical Dryers

Moisture is commonly removed from systems containing the refrigerant and oil charges by means of solid chemical drying agents which are generally placed in the refrigerant liquid line, sometimes in the vapor line.

The drying agent is ordinarily placed in a tube of a sufficiently large diameter that resistance to fluid flow is low and that the velocity of the refrigerant is cut down so as to increase time of contact with the drying agent.

The drying tube is usually equipped with fittings at both ends so that it can readily be connected into or taken out of the equipment at any time. The tube must be equipped with suitable filters at each end to prevent escape of small particles or drying agent to other parts of the refrigerating system.

These filters may be felt, mineral wool, glass wool, or other efficient filtering material backed up by metal screens. The filters should be so designed as to offer low resistance to fluid flow, especially under conditions where a cake of fine drying agent particles may be built up.

Because of the special qualities required of drying agents for refrigerating systems, not all of the available and useful drying agents are suitable for use in refrigerating machines. Further, although excellent drying agents are available for refrigerating systems, none can be expected to be perfect as there is no limit to what we can theoretically ask of a material.

We find that one material will excel in one point, another material in another point, and consequently we probably cannot say that there is one material that is better than all others for all applications.

TWO GENERAL TYPES

There are two general types of drying agents: those that hold water by adsorption and those that combine chemically with water. The adsorbents hold water by physical attraction between drying agent and water and are characterized by a physical form of high porosity which presents an extremely large surface to the material being dried.

For example, 1 cubic inch of the adsorbent Silica Gel is said to present an internal surface of over one acre. Drying agents that combine chemically with water may be divided into two types. The first type includes those in which the hydrated form is quite similar chemically to the anhydrous material and where, in general, the water is more loosely held.

An example is calcium chloride $CaCl_2$, which may take up water to form a number of definite hydrates such as the dihydrate, $CaCl_2 \cdot 2H_2O$.

The other chemical type of drying agent actually reacts with water to form a new chemical entity. For example, calcium oxide CaO, reacts with water to form calcium hydroxide, $Ca(OH)_2$. Broadly speaking, neither the adsorbent type nor the chemically reacting type has an advantage over the other, although each type may at times appear to advantage in comparing individual drying agents.

DESIRABLE QUALITIES

In order that we may properly judge the various solid drying agents let us first consider what qualities are desirable. The following properties would be included:

1. Insoluble in refrigerant, water, and oil.
2. Non-reactive with refrigerant and oil.
3. Non-corrosive, alone or in water solution.
4. High drying intensity or efficiency—low water vapor pressure.
5. High capacity—capable of taking up large quantities of water, preferably at high efficiency.
6. Rapid—short contact time with water required.
7. Not too rapidly (explosively) reactive with water.
8. Non-dusting—non-disintegrating.
9. Non-abrasive.
10. Acid removing or neutralizing.
11. Capable of being reactivated.
12. Low in resistance to fluid flow (favorable physical form and particle size).
13. Convenient and safe to handle.
14. Inexpensive.

Further explanation of these desirable qualities will appear in measuring the various drying agents up to them.

Individual Chemical Drying Agents

Activated Alumina, Drierite, and Silica Gel are probably the three best drying agents we have available for general use in refrigeration. None of these has yet been proved to have any particularly strong advantage over the other two that would permit calling it the best.

Another useful drying agent, one which is not as foolproof as the above three and therefore must be used with special care, is calcium oxide; it has advantages which are helpful in certain applications.

Activated Alumina, a partially hydrated form of aluminum oxide, is an adsorbent type drying agent. It measures up quite well to all of the desired qualities and is unexcelled in many. It is practically insoluble in water, oil, and refrigerants and is non-reactive and non-corrosive.

It has a high drying efficiency, being capable of drying gases down to about 0.0004 grain of moisture per cubic foot. Comparative drying efficiencies of various drying agents according to J. H. Bower (of the Bureau of Standards) are shown in Table 4. These values are for drying air, but the same relative order probably should apply when drying other gases. Data for refrigerants according to Dr. W. O. Walker are in Table 5. Discrepancies between the two tables may be due to differences in conditions such as space velocities and degree of loading.

The capacity of Activated Alumina for adsorbing moisture is fair; it will not adsorb more than about 8% of its own weight of water from liquid refrigerant but it can usefully adsorb as high as 15% water from vapor, not contaminated by oil. Its speed of taking up moisture is rather low compared to that of calcium oxide, for example.

As a drying agent takes up water, its drying efficiency drops. Since a slow drying agent may allow incompletely dried material to go through the dryer the first time the refrigerant passes through, the end particles of drying agent will soon take up appreciable amounts of water, and thus efficiency may be lowered earlier than would be the case with a rapid drying agent.

INCREASING SPEED

Effective speed of drying can be increased by using a larger diameter drying tube, thus lowering the linear velocity of the refrigerant and increasing time of contact.

Activated Alumina is not too rapidly reactive with water. A rapidly reactive drying agent may become hot due to the heat of hydration. This is undesirable since drying efficiency (intensity) drops as temperature increases.

Activated Alumina has a low dusting tendency, which follows from its high resistance to shock, crushing, and abrasion, and it does not tend to disintegrate on hydrating.

However, as with all available drying agents, the fact that a drying agent dusts at all requires that efficient filters be used to prevent abrasion of moving parts of equipment, harmful solid deposits, and in some cases, corrosion.

Activated Alumina, while neutral, is amphoteric. That is, it may react either as an acid or a base. It would not be expected to neutralize acids as does a basic material like calcium oxide, but we have found that it does remove hydrochloric acid from methyl chloride to a satisfactory degree. Whether this is due to adsorption of hydrochloric acid, aided by solution in adsorbed water, or to reaction with Activated Alumina to form aluminum chloride has not been proved. It is probable that aluminum chloride is formed at least after adsorption. Experimental data are shown in Table 3.

Activated Alumina, if not contaminated by oil, readily lends itself to reactivation by heating at 350° F. Reactivation after use in a refrigerating system is not practicable because of oil contamination. However, the reactivation property is valuable in recovering unused material that has picked up moisture by accident, for example, by exposure to moist air.

Being available in granular form of any reasonable size, and showing low dusting tendency, Activated Alumina, like all commonly used drying agents, presents low resistance to refrigerant flow when properly used. Four-eight mesh drying agent is commonly used as this size presents a good balance between resistance to fluid flow and speed of drying. Of course, smaller particles, presenting more external surface, dry more rapidly.

Activated Alumina is convenient and safe to handle. Like all drying agents, it should be handled with minimum exposure to air. It is in approximately the same price class as other good drying agents.

Grade C Activated Alumina, which is impregnated with calcium chloride, has double the capacity of grade A, which is the material ordinarily supplied. While Grade C thus has an advantage especially for drying air and gases, it should not be used for drying refrigerants, because of possible corrosive effects of the calcium chloride.

Drierite, which is a porous form of anhydrous calcium sulfate, $CaSO_4$, is unique among refrigerant drying agents in that it drys by both adsorbing water and chemically reacting with it.

The anhydride adds water to form the hemilhydrate, $CaSO_4 \cdot \frac{1}{2}H_2O$, which in turn can take up water, though less efficiently, to form the dihydrate. A review of its qualities shows it to be very similar to Activated Alumina as a drying agent, and therefore most of the various points above covered need not be separately reviewed.

We have no evidence as to its ability to remove acid; it would not chemically react with acid but might reduce acid to some extent, especially in a wet system, by adsorption. It is said to be less abrasive than either Activated Alumina or Silica Gel.

Molded forms of Drierite are available and are in use in hermetic units. The molded material is placed in a finely woven degummed cotton bag and the whole is placed in the unit where it will contact refrigerant liquid.

Silica Gel, is a highly porous form of silica, S_1O_2. Ordinary sand is a non-porous form of silica. Silica

(*Concluded on Page 23, Column 1*)

Table 3—Removal of Acid By Activated Alumina And Calcium Oxide (7)

Sample No.	Contents of Sealed Glass Tubes: Methyl Chloride	Activated Alumina	Calcium Oxide	Acidity of CH_3Cl As % Wt. HCL: Before	After	Condition Of CH_3Cl Before
1	25cc	2.5gm	None	0.153	0.0006	Dry
2	25cc	2.5gm	None	0.153	0.0006	Dry
3	25cc	2.5gm	None	0.153	0.0006	Wet
4	25cc	2.5gm	None	0.153	0.0006	Wet
5	50cc	5gm	None	0.0025	0.0005	Wet
6	50cc	None	2.5gm	0.153	0.0003	Dry
7	50cc	None	2.5gm	0.153	0.0003	Dry
8	50cc	None	2.5gm	0.153	0.0006	Wet
9	50cc	None	2.5gm	0.153	Sl. Alkaline	Wet
10	50cc	None	2.5gm	0.0025	0.0000	Wet

Table 4—Comparative Efficiencies of Drying Agents In Drying Air (2)

Drying Agent	Volume Air Per Hr. Per cc Dessicant Liters	Total Air Per cc Dessicant Liters	Average Water Remain mg. Liter Air
Activated Alumina	65—135	6.5— 7.7	0.005
Calcium Sulphate	75—150	1.2—18.5	0.005
Silica Gel	65—135	6.5— 7.7	0.03
Calcium Oxide	60— 90	7.6—10.1	0.003
Calcium Chloride	75—240	1.2— 7.8	0.36

Apparently determined at 25—35°C. (77—95°F.)

Table 5—Comparative Efficiencies of Drying Agents In Drying Refrigerants (3)

Dryer	Refrigerant	Phase Treated L—Liquid V—Vapor	Percentage Remaining Water: .25% Initial Water	.03% Initial Water
Activated Alumina	Sulphur Dioxide	L	.15	.005
Activated Alumina	Sulphur Dioxide	V	.01	....
Activated Alumina	Methyl Chloride	L	.02	.006
Activated Alumina	Methyl Chloride	V	.01	....
Drierite (Cal. Sulphate)	Sulphur Dioxide	L	.15	.009
Drierite (Cal. Sulphate)	Sulphur Dioxide	V	.08	....
Drierite (Cal. Sulphate)	Methyl Chloride	L	.05	.003
Drierite (Cal. Sulphate)	Methyl Chloride	V	.04	....
Silica Gel	Sulphur Dioxide	L	.15	.006
Silica Gel	Sulphur Dioxide	V	.01	....
Silica Gel	Methyl Chloride	L	.01	.004
Silica Gel	Methyl Chloride	V	.01	....
Calcium Oxide	Sulphur Dioxide	L	.20	....
Calcium Oxide	Sulphur Dioxide	V	.15	....
Calcium Oxide	Methyl Chloride	L	.15	....
Calcium Oxide	Methyl Chloride	V	.08	....
Calcium Chloride	Sulphur Dioxide	L	.09	.013
Calcium Chloride	Sulphur Dioxide	V	.03	.005
Calcium Chloride	Methyl Chloride	L	.10	....
Calcium Chloride	Methyl Chloride	V	.04	

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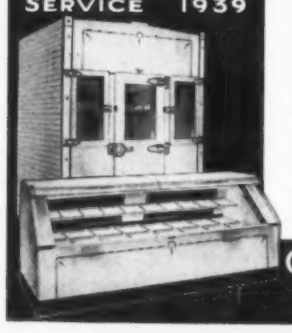

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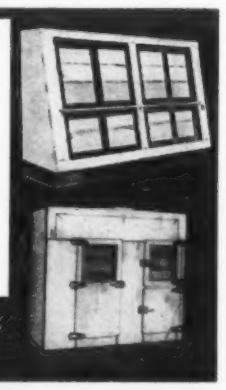

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How Various Chemical Drying Agents React With Refrigerants

(Concluded from Page 22, Column 5)

Gel is an adsorptive material very similar to Activated Alumina in its drying properties. It, like Drierite, probably does not remove acid to a safe low percentage.

Calcium Oxide or unslaked lime, C_aO, takes up water by reacting with it to form calcium hydroxide, $C_a(OH)_2$, which is commonly known as slaked lime. It is alkaline in reaction and readily neutralizes acid methyl chloride as is shown by data in Table 3.

MAIN OBJECTION

The main objection to its use is its property of disintegrating to a fine powder when it takes up water, often resulting in the fine particles passing an inefficient filter or creating high resistance to flow by blocking the filter. The particles are fairly soft and therefore probably not very abrasive.

However, there is another possible undesirable consequence of their being free in a system in that both calcium oxide and calcium hydroxide react slowly with halogenated hydrocarbon refrigerants to form calcium chloride, which may cause corrosion.

In spite of its disadvantages, calcium oxide has certain advantages for methyl chloride systems when used carefully as a temporary installation for a few days and followed, if necessary, by a permanent dryer charged with Activated Alumina, Drierite, or Silica Gel.

In addition to neutralizing acid systems, it has the advantage of rapidly absorbing water in the liquid line of methyl chloride systems. One pass removes a comparatively high percentage of water, and as a consequence, there is not so great a tendency for a system to freeze up a second time, while the dryer is on the system.

Its theoretical capacity is high (32.1%) but it should not be loaded beyond 8-10% at most because of its disintegrating property. It should be used with efficient filters.

RATE IS LOW

A further reason for its not being used in permanent dryers is its tendency toward hydrocarbons. Table 6 shows reaction rates of this and other alkaline drying agents with methyl chloride. It may be noted that the rate for calcium oxide is very low.

The use of calcium oxide and other alkaline materials for drying refrigerating systems is claimed by United States Patent 1,809,833 assigned to the Chicago Pneumatic Tool Co.

Calcium Chloride, C_aCl_2, combines loosely with water to form hydrates. Its main disadvantages are its ready solubility in water and the corrosive effect of its water solution. Because of the possibility of calcium chloride solution being carried out of the dryer by rapid passage of a slug of water through it or due to overloading of the dryer, its use in refrigerating systems is not recommended.

There is also a possibility of its contaminating the system and causing corrosion by escape of small particles past the filters or even by solution in the refrigerant. Calcium chloride is about 0.0024% soluble in methyl chloride, compared to about .0002% for calcium oxide. Calcium chloride will not reduce acidity.

Soda lime is a mixture of sodium hydroxide, N_aOH, and calcium oxide. Its drying properties are much like those of calcium oxide, but it has less tendency to disintegrate and reacts more rapidly with halogenated hydrocarbons, as is shown by Table 6. Sodium hydroxide is water soluble.

Soda lime has been used only with methyl chloride, and then mainly to combat copper "plating." It and other strongly alkaline materials should not be used with refrigerants unless the rate of reaction is known —an explosion may result from a too rapid reaction.

The remarks on soda lime apply to **caustic soda** (sodium hydroxide), N_aOH, and **caustic potash.** These have an additional disadvantage in being completely water soluble and should not be used.

Barium Oxide is similar to calcium oxide, but is too reactive with water and has been known to cause explosions. The explosions may result from heat reaction with water, possibly accompanied by reaction with the refrigerant.

Magnesium Perchlorate, Barium Perchlorate or any other perchlorate should not be used in refrigerating systems because of the possibility of serious explosions when contacted with organic materials such as lubricating oil or methyl chloride.

Phosphorous Pentoxide has excellent drying qualities but it dissolves in water to form phosphoric acid. It is ordinarily supplied as a fine, light powder which is difficult to handle.

Table 6—Reaction Rates—Methyl Chloride and Alkaline Drying Agents (7)

Contents of Tubes	Temp. °F.	Storage Time Hours	Chlorides In Drying Agents Before	Chlorides In Drying Agents After	CH_3Cl Decomposition % Per Hr.
25cc CH_3Cl plus 10 gm CaO	77°	24	0.017%	0.038%	0.006%
25cc CH_3Cl plus 10 gm CaO	122°	24	0.017%	0.045%	0.007%
25cc CH_3Cl plus 10 gm soda lime	77°	72	0.151%	2.73 %	0.021%
25cc CH_3Cl 5 gm potassium hydroxide	122°	24	0.12 %	2.13 %	0.024%
25cc CH_3Cl 5 gm sodium hydroxide	77°	64	0.14 %	0.83 %	0.003%
25cc CH_3Cl 5 gm sodium hydroxide	122°	24	0.14 %	2.61 %	0.030%

Using Dryers With Various Refrigerants

It may be seen that Activated Alumina, Drierite, Silica Gel, and calcium oxide may be used with methyl chloride and methylene chloride. The manufacturer of the "Freons" recommends Activated Alumina, Silica Gel, and Drierite. Temporary use of Calcium Oxide with "Freon-12" has been reported.

The halogenated hydrocarbon refrigerants generally employ a dryer to best advantage in the liquid line where it can remove water before it gets to the "expansion" valve. Pressure drop losses are lower with a dryer installed in the liquid line and the theoretically better efficiency of vapor line drying is balanced to some extent by the lower fluid velocities in the liquid dryer which promotes higher efficiency.

In any event, satisfactorily low moisture contents can be obtained by drying the liquid halogenated hydrocarbons.

Sulphur dioxide presents special problems. In the first place, liquid phase drying is inefficient (Table 5) although water can be removed quite well from the vapor by installation of a dryer in the suction line.

However, as liquid sulphur dioxide containing water boils, the moisture tends to remain behind as the sulphur dioxide vapors pass off. Therefore, especially with flooded evaporators, it takes a comparatively long time for the water to leave the evaporator and reach the dryer, and in the meantime, the equipment may have been corroded to an appreciable extent.

Halogenated hydrocarbon refrigerants, having a very low solubility for water, tend to allow early escape of water even from flooded evaporators by the process of two-phase or "steam" distillation as well as by virtue of the known principal that a small amount of a dissolved material of low solubility exerts an abnormally high vapor pressure.

Still another difficulty with sulphur dioxide is that, because of the lack of warning of the presence of moisture by a freeze-up, serious damage may take place before the presence of moisture is suspected. However, temporary installation of a large diameter suction line dryer charged with large particles of drying agent is useful as long as a machine is running, and may well be used for insurance after charging or overhauling a machine. According to V. E. Hall, heating the evaporator after pumping down the low side will help speed the drying if the vacuum pumping on the evaporator is continued so as to draw the water vapor to the dryer.

Technique With Dryers

A vapor line dryer of the conventional type should be installed upright with the exhaust and at the bottom to allow for oil drainage. Some designs can be installed horizontally.

In the case of a liquid line dryer, the exhaust end should best be uppermost to keep the tube filled with liquid and thus insure maximum contact time.

The quantity of drying agent that should be used is, of course, dependent upon the moisture content of the system and therefore difficult to judge.

V. E. Hall's suggestion of 0.1 pound of dryer per pound of refrigerant as an average for a service dryer and 0.05 pound of dryer per pound of refrigerant for a precautionary service dryer installed on a supposedly dry system seems reasonable. Removal of moisture from a very wet system should not be attempted with a dryer. New refrigerant and oil charges are needed, and the system should be dried by a vacuum or flushing treatment before these are added.

The size of drying tube selected for a given job should generally be in accordance with the manufacturer's recommendation since this will vary with machine tonnage, refrigerant being treated, size of drying agent particles, and details of design of the drying tube such as filter area and type of filter.

Indicating types of Drierite and Activated Alumina have been used to warn of spent drying agent. These are impregnated with cobalt chloride which is pink when moist, blue when dry.

As cobalt chloride is water soluble there may be some danger of corrosion and therefore these indicating types are not recommended for refrigerating systems.

Long continued or repeated use of a dryer may be necessary if moisture is introduced by a suction leak or is masked by oil.

When a dryer is installed in the liquid line after refrigeration stops as a result of a freeze-up, the system may be allowed to stand until the ice melts, or gentle heat may be applied to speed the melting.

Then if the refrigerant flow is throttled down sufficiently, the dryer can remove water efficiently so that there is less chance of repeated freeze-ups before the system is dry. A system warm throughout speeds the drying by hastening the escape of water from the evaporator and preventing continued freeze-ups.

Antifreezes and Liquid 'Drying' Agents

Separation of water as ice in a refrigerating system is sometimes prevented by the addition of an antifreeze such as methyl alcohol. Such use of the latter in methyl chloride systems is claimed by U. S. Patent 1,570,080 issued to Roscoe R. Stitt.

Antifreezes of this nature do not remove water or change it chemically to harmless compounds, but allow it to remain in the system where it may exert its other bad effects such as corrosion. Therefore, if an antifreeze is used to open up a frozen system or to keep it open, it should always be followed by a chemical dryer to remove water.

The antifreeze itself should be non-corrosive and otherwise harmless. Recent research by the du Pont Laboratories has shown that while pure methyl chloride and pure methyl alcohol are themselves essentially non-corrosive to common engineering metals, a mixture of the two ultimately becomes somewhat corrosive to steel. The same is probably true with other halogenated hydrocarbon refrigerants.

Liquid "drying" agents are quite different in principle from the above mentioned antifreezes, and have been suggested as a cure for wet systems because of their reaction with water to form harmless or relatively harmless reaction products.

One such material, for which the manufacturer reports good results in test and actual practice, is an alkaline preparation intended for use with hydrocarbon and halogenated hydrocarbon refrigerants. Being an alcoholic solution of various sodium organic compounds, it eventually forms sodium chloride and alcohols when used in wet halogenated hydrocarbon systems.

Any liquid "drying" agent, before being unqualifiedly accepted, should have shown through tests and field experience that it and its reaction products are essentially harmless to a refrigerating system.

We can summarize all of the foregoing by saying that moisture is definitely harmful in refrigerating systems, and all reasonable precautions should be taken to keep it out in the first place; if moisture gets into a system before refrigerant and oil are charged, it may be removed by a vacuum or dry gas flushing method, which may be followed by a chemical dryer after the system is charged; if moisture is contained in small quanities in a system charged with a halogenated hydrocarbon refrigerant, it may be removed by a chemical dryer such as Activated Alumina, Drierite, or Silica Gel in the liquid line—in sulphur dioxide systems these dryers may be used in the suction line but results are less sure; if moisture is present in a charged system in considerable quantity, the system must be discharged, dried, recharged, and then, for added insurance, treated with a chemical dryer.

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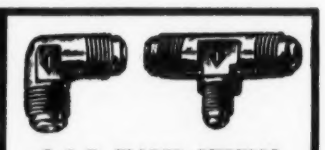
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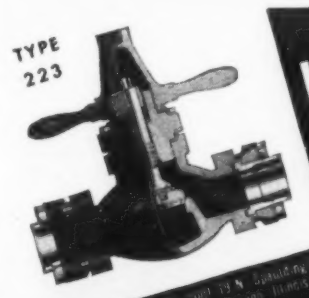

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Crosley

Crosley Corp.
Electric Refrigerators

Saturday Evening Post	$ 27,320
Life	4,650
Liberty	4,536
Good Housekeeping	4,304
Collier's	3,996
Woman's Home Companion	3,844
Ladies' Home Journal	3,816
True Story	3,800
McCall's	3,456
American Magazine	3,168
Time	2,787
Look	1,744
The New Yorker	1,014
Nebraska Farmer	46
Total	**$ 68,481**

Electrolux

Servel, Inc.
Gas Refrigerators

Saturday Evening Post	$ 74,500
Good Housekeeping	18,900
Collier's	8,700
Life	5,700
American	4,500
Better Homes & Gardens	4,750
American Home	4,200
Holland's	945
Total	**$122,195**
Kerosene Refrigerators	
Country Gentleman	38,400
Farmer's Wife	11,400
Capper's Farmer	5,250
Successful Farming	5,130
Progressive Farmer & Southern Ruralist	4,914
Household	2,850
Country Home	2,250
Farm Journal	1,950
Southern Agriculturist	1,435
The Farmer Stockman	1,184
Washington Farmer	945
Oregon Farmer	792
Pennsylvania Farmer	546
Southern Planter	525
Semi-Weekly Farm News	481
Montana Farmer	226
Michigan Farmer	224
The Farmer	70
Total	**$ 78,572**
Grand Total	**$200,767**

Frigidaire

Frigidaire Division, General Motors Corp.
Electric Refrigerators

Saturday Evening Post	$ 58,450
Collier's	37,140
Woman's Home Companion	28,400
Liberty	22,100
Ladies' Home Journal	20,000
McCall's Magazine	18,000
Good Housekeeping	16,610
American Magazine	12,650
Better Homes & Gardens	11,700
Household	11,400
Life	11,400
True Story	10,900
American Home	10,050
Cosmopolitan	7,700
Woman's World	4,320
Holland's	3,600
Graduate Group	3,000
Field and Stream	825
Total	**$288,245**
Refrigerators and Ranges	
Saturday Evening Post	11,500
Woman's Home Companion	11,300
Total	**$ 22,800**
Refrigerators, Ranges, and Water Heaters	
House Beautiful	1,450
Total	**$ 1,450**
Commercial Refrigeration	
Time Magazine	9,900
Saturday Evening Post	8,000
Nation's Business	5,900
Newsweek	4,200
Business Week	3,260
Total	**$ 31,260**
Frozen Storage Cabinets	
Country Life	550
Total	**$ 550**
Grand Total	**$344,305**

Frick

Frick Co.
Industrial Refrigeration

Time	$ 8,900
Business Week	1,920
Nation's Business	1,910
Total	**$ 12,730**

General Electric

General Electric Co.
Electric Refrigerators

Saturday Evening Post	$ 34,500
Ladies' Home Journal	34,500
Collier's	26,100
Woman's Home Companion	22,600
American Magazine	21,000
Good Housekeeping	20,790
True Story	16,350
Better Homes & Gardens	15,650
American Home	11,700
Country Gentleman	11,350
Liberty	6,680
Holland's	6,100
Parent's Magazine	5,700
House Beautiful	4,600
Popular Science	3,500
Popular Mechanics	3,100
House & Garden	2,200
Sunset	1,000
Total	**$247,420**
Refrigerators, Ranges, and Sinks	
Saturday Evening Post	26,450
Total	**$ 26,450**
Combined Appliances	
This Week	13,500
Total	**$ 13,500**
Grand Total	**$287,370**

Hotpoint

Edison General Electric Appliance Co., Inc.
Electric Refrigerators

Saturday Evening Post	$ 38,000
American Weekly	38,000
Collier's	27,200
Ladies' Home Journal	15,000
McCall's	8,440
Total	**$126,640**

Leonard

Leonard Division, Nash-Kelvinator Corp.
Electric Refrigerators

Liberty	$ 4,300
Total	**$ 4,300**
Refrigerator Contest	
Saturday Evening Post	16,000
Total	**$ 16,000**
Grand Total	**$ 20,300**

Kelvinator

Kelvinator Division, Nash-Kelvinator Corp.
Electric Refrigerators

Saturday Evening Post	$ 52,900
Collier's	28,710
Household	17,100
Total	**$ 98,710**
Industrial Refrigeration	
Fortune	1,400
Total	**$ 1,400**
Grand Total	**$100,110**

Norge

Norge Division, Borg-Warner Corp.
Electric Refrigerators

Saturday Evening Post	$ 31,000
American Weekly	20,000
This Week	14,500
Good Housekeeping	12,600
Woman's Home Companion	8,550
Collier's	6,000
Better Homes & Gardens	4,750
American Home	4,200
Parent's	1,900
Total	**$103,500**

Superfex

Perfection Stove Co., Inc.
Kerosene Refrigerators

Progressive Farmer	$ 6,552
Southern Planter	1,680
The Farmer—Local & General	1,428
Farm & Ranch	1,420
Western Farm Life	942
Montana Farmer	339
Nebraska Farmer	81
Nebraska Farmer Z	136
Total	**$ 12,578**
Oil Refrigerators and Ranges	
Country Home	10,560
Weekly Kansas City Star	1,696
Total	**$ 12,256**
Grand Total	**$ 24,834**

Westinghouse

Westinghouse Electric & Mfg. Co.
Electric Refrigerators

Saturday Evening Post	$ 69,000
Collier's	43,500
Household	22,500
American Magazine	21,000
Good Housekeeping	17,600
Total	**$173,600**
Combined Appliances	
American Weekly	$ 78,000
This Week	41,500
Total	**$119,500**
Grand Total	**$293,100**

20 Win $1,000 Prizes In G-E 'Home' Contest

NEW YORK CITY—Winners in General Electric Co.'s "Electrical Standard of Living" contest have been announced by C. W. Stuart, manager of the G-E home bureau.

Each of the 20 home-building prize-winners has been awarded a check for $1,000.

The winners are: Mrs. Mary-Louis K. Alford, Buffalo; H. C. Bender, Spokane, Wash.; Earl J. Confer, Detroit; James F. Eppenstein, Chicago; Mrs. J. S. Feldhusen, Kimberly, Ida.; G. K. Frisbie, Ranco Santa Fe, Calif.; R. D. Guthrie, Gates Mills, Ohio; John P. Illges, Columbus, Ga.; John C. Lyons, Marblehead, Mass.; John S. McKenzie, Elkins Park, Pa.

Mrs. Dorothy Moffett, Indianapolis; Olive G. Moore, Highland Park, Ill.; Y. W. Nibecker, Huntington Park, Calif.; John S. Osterstock, Shrewsbury, N. J.; A. Parker Terryberry, Grand Rapids, Mich.; Texas Master Builders, Houston, Tex.; Waldo & Weller, Inc., Detroit; Philip Will, Jr., Chicago; Wilbur R. Williams, Boulder, Colo.; and David E. Winkworth, Monroe, Mich.

The awards were made for homes, built or modernized during the 18 months preceding the closing date of Dec. 24, 1938, which, in the opinion of a jury, most nearly met a number of specifications.

Of the $4,000,000 worth of homes submitted in the contest, about 33% of new homes were Colonial, 21% bungalow type, 16% modern, and 10% English.

Aim of the contest, said Mr. Stuart, was to encourage greater attention to the 10 listed specifications—heating and air conditioning; electrification; insulation and sound deadening; plumbing and sanitation; new materials; landscaping and interior decoration; quality materials and equipment; sound construction and skilled labor; good location and architecture; and sound financing.

Advertising Expenditure Dropped Sharply In '38

(Concluded from Page 1, Column 5)

Servel, Inc. was the only other manufacturer to break the $200,000 mark. This it did by spending $122,195 to advertise its gas refrigerators in eight national magazines and $78,572 to advertise its kerosene refrigerators in 18 farm publications.

Hotpoint, only company to exceed its 1937 expenditure, came in fifth with $126,640, while Norge ran sixth with $103,500. The other manufacturers followed in this order: Kelvinator, $100,110; Crosley, $68,481; Superfex, $24,834; and Leonard, $20,300.

In 1937, the "Big Three" in magazine advertising of refrigerators were Frigidaire, Norge and Westinghouse, in that order.

In addition to its household refrigerator expenditures, Frigidaire spent $31,260 to advertise its commercial refrigeration equipment in nationally circulated publications, and $550 to promote its frozen storage cabinets. Kelvinator spent $1,400 on its industrial refrigeration, and Frick Co.'s expenditures for advertising this same type of equipment totaled $12,730.

Robertson Bros. Open Store

MORRILTON, Ark.—Earl and Elvis Robertson have opened Robertson Appliance Store here to handle a full line of electrical and gas appliances, including refrigeration equipment.

American Management Association To Discuss Appliance Merchandising

NEW YORK CITY—Sales methods of the household electrical equipment industry will be up for discussion at the session on "Keystone Principles in Successful Selling" scheduled for the afternoon of the first day of the American Management Association's marketing conference to be held April 12 and 13 at Hotel Commodore here.

This presentation will take the form of a report on the selling methods in use by five organizations in five different industries: household electrical equipment, casualty insurance, office equipment, magazine publications, and radio broadcasting.

Covering such problems of sales management as the recruiting and selection of salesmen, training and supervision of the sales force, sales compensation, and job planning, the report will point out the basic similarities in the five selling systems compared. The report will be followed by floor discussion.

Also scheduled for discussion on the same afternoon is "The 'Washington Angle' in Sales Management." The entire afternoon program is listed under the heading: "Organizing for Efficient Selling."

Another opening-day feature will be a symposium on marketing problems for treasurers, production managers, and personnel directors, as well as sales executives. Purpose of this discussion will be to improve inter-departmental coordination.

'7-Zone' Refrigeration Features Zenith Line Of Marshall-Wells

(Concluded from Page 1, Column 2)

three moving parts), the "Speede-Freezer" (a newly designed, double-width evaporator), and a triple-sealed all-steel cabinet.

The refrigerating mechanism is powered by a ⅛-hp. Delco-Frigidaire motor. The pure-copper, natural-draft finned condenser has 4,670 sq. in. of radiating surface. The "Silent Watchman" replaces fuses, and protects the mechanism against overload damage.

The one-piece freezer unit is constructed of bronze, with electroplated rustproof finish. Refrigerant flows through freezer walls and under each freezer shelf. Lower shelf of this unit is removable to provide frozen-storage space for such items as ice cream or frozen foods.

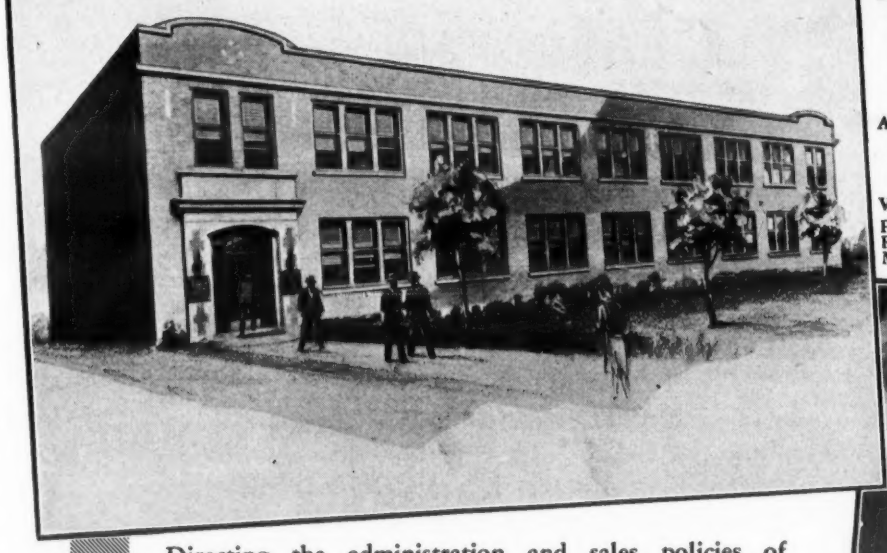
The one-piece inner and outer shells of the Zenith cabinet are of Bonderized heavy-gauge Armco rust-resisting steel, welded at every joint and seam. Boxes are insulated with Thermocraft insulation, triple-sealed in water-tight packages. Cabinets are finished in Dulux.

Other features offered on various models of the line are an automatic defrosting device, an "easy-opening" door handle, sliding utility basket, cube release, exterior thermometer to register interior temperatures, and pottery sets. All models use "Freon-12" refrigerant, and all are sold under a five-year protection guarantee.

For Dependable Air Conditioning . . .

A-P Valves

NESCO, The World's Largest Manufacturer of Housewares

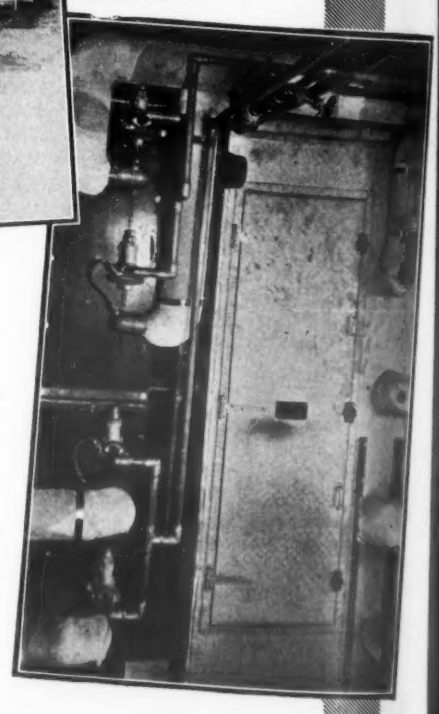


Installation . . .
Administrative offices of National Enameling & Stamping Co.
Milwaukee, Wis.
Manufacturer of "NESCO" Products

Air Conditioning by
CARRIER CORPORATION
Standard Distributing Corp.,
Milwaukee, Wis.

Valves — A-P

Purchased through
Refrigeration Specialty Co.
Milwaukee, Wis.



Directing the administration and sales policies of Nesco's far-flung organization is accomplished with greater efficiency and comfort in their newly air conditioned Milwaukee Office. Here, too, A-P Thermostatic Expansion Valves provide the usual dependable trouble-free refrigerant control — always the sign of a satisfactory installation.

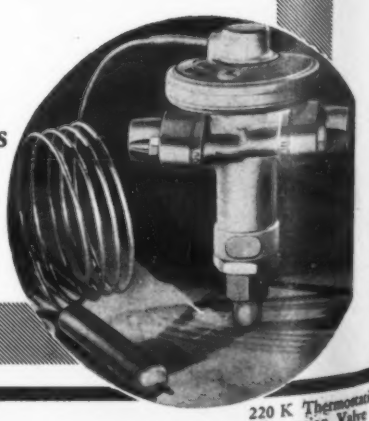
Ask the "Man who uses them". He'll tell you to demand A-P Valves for EVERY NEW INSTALLATION. Then you'll avoid trouble later, — because A-P Valves have a record of long life, accuracy in control, and economy in operation that has never been surpassed.

AUTOMATIC PRODUCTS COMPANY
2450 NORTH THIRTY — SECOND STREET
MILWAUKEE WISCONSIN

The Refrigeration Service Engineer Speaks

When I come upon an installation that shows any sign of "Valve Trouble" there's always one sure remedy — I just . . . . . .

SWITCH TO A-P VALVES . .
THEN TROUBLE STOPS !



220 K Thermostatic Expansion Valve

DEPENDABLE THE BYWORD FOR A-P CONTROLS